

Maryland Department of the Environment
National Pollutant Discharge Elimination System (NPDES)
Municipal Separate Storm Sewer System (MS4)

Permit Number 11-DP-3310 (MD0068268)



Barry Glassman
County Executive

Harford County, Maryland
Department of Public Works
Watershed Protection and Restoration Office

2017 Annual MS4 Report

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Introduction

The Clean Water Act adopted in 1972, established the National Pollutant Discharge Elimination System program, or NPDES for industrial facilities that discharge process wastewater to receiving streams or groundwater. Before discharging process wastewater, the industrial facility must apply for and receive an NPDES permit.

The 1987 Clean Water Act amendments updated the NPDES regulations to include discharge from stormdrain pipes, or Municipal Separate Storm Sewer Systems (MS4). Jurisdictions nationwide with populations over 100,000 were required to submit a two-phase application for an individual five-year NPDES MS4 permit.

In Maryland, the Maryland Department of the Environment (MDE) was delegated the program by the U.S. Environmental Protection Agency (EPA). Harford County received its first permit on May 17, 1994 and reissued permits on August 13, 1999, November 1, 2004 and December 30, 2014.

As established in the MS4 permit, annual reports are due on the anniversary of the effective date of the permit. The information contained in the annual reports document activities completed towards meeting the requirements of the permit.

This document is the third annual report since the issuance of Harford County's MS4 permit on December 30, 2014. The current permit requires annual reports to be submitted for the fiscal year (July 1 through June 30). The reporting period for this annual report is July 2016 through June 2017.

The language from the permit is repeated in this annual report to compare each permit requirement with the activities completed to address the requirement. The permit language is shown within gray text boxes. The remaining text is Harford County's response to each permit requirement.

MARYLAND DEPARTMENT OF THE ENVIRONMENT
NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM
MUNICIPAL SEPARATE STORM SEWER SYSTEM DISCHARGE PERMIT

PART I. IDENTIFICATION

A. Permit Number 11-DP-3310 (MD0068268)

B. Permit Area

This permit covers Stormwater discharges to and from the municipal separate storm sewer system owned and operated by Harford County, Maryland.

C. Effective Date December 30, 2014

D. Expiration Date December 29, 2019

PART II. DEFINITIONS

Terms used in this permit are defined in relevant chapters of Title 40 of the Code of Federal Regulations (CFR) Parts 122-124 or the Code of Maryland Regulations (COMAR) 26.08.01. Terms not defined in CFR or COMAR shall have the meanings attributed by common use.

PART III. WATER QUALITY

The permittee must manage, implement, and enforce a Stormwater management program (SWMP) in accordance with the Clean Water Act (CWA) and corresponding Stormwater National Pollutant Discharge Elimination System (NPDES) regulations, 40 CFR Part 122, to meet the following requirements:

1. Effectively prohibit pollutants in Stormwater discharges or other unauthorized discharges into the MS4 as necessary to comply with Maryland's receiving water quality standards;
2. Attain applicable wasteload allocations (WLAs) for each established or approved Total Maximum Daily Load (TMDL) for each receiving water body, consistent with Title 33 of the U.S. Code (USC) §1342(p)(3)(B)(iii); 40 CFR §122.44(k)(2) and (3); and

3. Comply with all other provisions and requirements contained in this permit, and in plans and schedules developed in fulfillment of this permit.

Compliance with all conditions contained in PART's IV through VII of this permit shall constitute compliance with §402(p)(3)(B)(iii) of the CWA and adequate progress toward compliance with Maryland's receiving water quality standards and any EPA approved Stormwater WLAs for this permit term.

Harford County recognizes the need to improve water quality in the Chesapeake Bay and local Harford County streams. We also recognize through the MS4 permitting program, the responsibility of local governments to participate in the restoration of our waters.

Harford County, however, has reiterated throughout the permit issuance process, that the permit requirements listed herein exceed Harford County's maximum extent practicable (MEP), considering both limited financial capabilities and short timeframes for implementation. MEP is the legal compliance standard for MS4s established by the Clean Water Act. Additionally, although Part I.B. of the permit correctly defines the MS4 Permit Area, outside of the permit MDE expressed a more expansive interpretation of the regulated permit area.

The County expressly reserves its rights to reduce the acreage associated with the impervious surface area assessment in Part IV.E.2.a. of the permit, which in turn impacts the County's restoration efforts during this permit term under Part IV.E.2.a., to the minimum acreage required by the permit. The County expressly reserves its rights to make refinements to its assessment as necessary in the future based upon new or additional information consistent with an adaptive management approach.

Part IV. STANDARD PERMIT CONDITIONS

A. Permit Administration

Harford County shall designate an individual to act as a liaison with the Maryland Department of Environment (MDE) for the implementation of this permit. The County shall provide the coordinator's name, title, address, phone number and email address. Additionally, the County shall, in its annual report, submit to MDE an organizational chart detailing personnel and groups responsible for major NPDES program tasks in this permit. MDE shall be notified of any changes in personnel or organization relative to NPDES program tasks.

With the issuance of this permit, Harford County has increased both staff and financial capacity for the implementation of the MS4 program.

In order to accelerate permit requirements, Harford County continues to utilize and expand the use of open-end contracts. During this reporting period, the County increased the open-end contract for design-build from \$800,000 to \$4,000,000 annually. This should allow for a portion of the watershed restoration projects to be completed in shorter timeframes than traditional design-bid-build projects. Additionally, during this reporting period, the County issued a new open-end contract for landscaping services including routine maintenance for stormwater management facilities and tree plantings. A contract was also issued this reporting report for a consultant project manager to assist with watershed restoration design projects.

The MS4 program is administered through the Department of Public Works, Office of Watershed Protection and Restoration, here forward called the Harford County MS4 Office (listed below) with support from other departments throughout the county government (Appendix A). Additionally, Harford County utilizes various partnerships with outside agencies to accomplish permit requirements.

Department of Public Works
Office of Watershed Protection and Restoration
212 South Bond Street
Bel Air, MD 21014
(410) 638-4109

Joseph Siemek, P.E. (Director, Public Works), (410) 638-3285

Scott Kearby (Deputy Director, Construction Management), extension 1252

Christine Buckley, P.E. (MS4 Program Manager, **primary liaison**) extension 1176

Betsy Collins (MS4 Capital Projects Manager, **alternate liaison**), extension 1394

Michele Dobson (MS4 Monitoring Manager), extension 1247

Laura Coste (MS4 Outreach Coordinator), extension 2448

B. Legal Authority

Harford County shall maintain adequate legal authority in accordance with NDPES regulations 40 CFR Part 122.26 throughout the term of this permit. In the event that any provisions of its legal authority is found to be invalid, the County shall notify MDE within 30 days and make the necessary changes to maintain adequate legal authority. All changes shall be included in the County's annual report.

Harford County Code Chapter 214 and Chapter 109 provide adequate legal authority for the implementation of this permit.

During this reporting period, there were no bills or resolutions related to the implementation of this permit.

C. Source Identification

Sources of pollutants in stormwater runoff countywide shall be identified and linked to specific water quality impacts on a watershed basis. The source identification process shall be used to develop watershed restoration plans. The following information shall be submitted annually for all County watersheds within the permit area in geographic information system (GIS) format with associated table as required in PART V of this permit.

In May 2017, MDE distributed an updated *MS4 Geodatabase Design and User's Guide*. The updated documentation was the result of collaboration between MDE and the Phase I MS4 jurisdictions to address concerns from the jurisdictions. This geodatabase structure is very robust with multiple relational tables. Migration of existing data into this format will be labor intensive. Therefore, a clear understanding of the geodatabase structure is necessary prior to full implementation.

To ensure that full credits are applied towards the stormwater management practices and restoration practices, Harford County requests MDE provide documentation for how the data is extracted from the MDE geodatabase for load calculations; specifically, the fields used and the methods for calculating loads. A clear understanding of how the data is used will ensure the most accurate data entry.

1. Stormdrain system: all infrastructures, major outfalls, inlets and associated drainage areas delineated;

Stormdrains

New stormdrains were installed associated with the 2.39 miles of roadway accepted by Harford County during this reporting period.

All stormdrain features, including point features (i.e. outfalls, manholes, inlets, etc.), stormdrain pipes, and stormdrain drainage areas were entered into the County geodatabase, Stormdrains.mdb.

The locations for the point features were input into the County geodatabase by georeferencing stormdrain design drawings. Associated attributes for the point features were also entered.

Point Features - 218

Outfalls (Closed Systems) - 28

Outfalls (Water Quality) - 9

Inlets - 91

Manholes - 90

Using the point features, lines for the stormdrain pipe were added to the County geodatabase and the associated attributes were entered.

Drainage Areas

There was one major outfall (36" or larger in diameter for non-industrial and 12" or larger for industrial) for roads accepted during this reporting period.

The drainage area was input into the County geodatabase by georeferencing stormdrain design drawings. Associated attributes for the drainage area feature were also entered.

A map of the outfalls and table of attributes are included in Appendix C1. The spatial and tabular data for the outfall locations (Outfall point feature class) and drainage area (OutfallDrainageArea polygon feature class) were imported into the MDE geodatabase and submitted with this report.

2. Industrial and commercial sources: industrial and commercial land uses and sites that the County has determined have the potential to contribute significant pollutants;

The selection of the businesses to survey for potential impact to water quality is based on locations within commercial and/or industrial parks and parcels with an industrial or commercial landuse as noted in the State tax assessment records. During this reporting period, 27 potential hotspot cases were active. The spatial and tabular data for potential hotspots was input into the County geodatabase, Hotspots.mdb.

A map of the businesses and table of attributes are included in Appendix C2. A copy of the County geodatabase was submitted with this report. The MDE geodatabase contains no features classes or tables for hotspot investigations.

3. Urban best management practices (BMPs): stormwater management facility data including outfall locations and delineated drainage areas;

Stormwater Management Facilities

During this reporting period, 26 stormwater management projects were as-built for a total of 95 practices; approximately 1/3 are drywells, 1/3 are microbioretention and the remaining 1/3 are a variety of other practices. One project utilized rooftop disconnection and one project utilized non-rooftop disconnection:

The limits for each BMP were digitized into the County geodatabase, StormwaterNEW.mdb by georeferencing stormwater design drawings. The associated attributes for the polygon features which replicate the BMP table in the geodatabase were also entered.

Stormwater Management Drainage Areas

Selecting the proper point of interest and associated drainage area requires a clear understanding of how the data will be extracted from the MDE geodatabase to calculate loads. As discussed above, Harford County requests that MDE provide that information. Once the information is provided, the County will delineate all points of interest and associated drainage area for all of the stormwater management facilities.

A map of the stormwater locations and table of projects are included in Appendix C3. A copy of the County geodatabase was submitted with this report

Stormwater Management Waivers, Exemptions, and Fees in Lieu

During this reporting period, 19 projects were not required to provide stormwater management. The spatial and tabular data for all stormwater waivers, exemptions and fees in lieu is maintained in the County geodatabase, Stormwater.mdb.

Stormwater Management- 19

Waivers – 12

Exemptions – 6

Fees in Lieu – 1

A map of the waivers, exemptions and fees in lieu and table of attributes are included in Appendix C3. The totals for each were entered into the MDE geodatabase (SWM table) and submitted with this report.

4. Impervious surfaces: public and private land use delineated, controlled and uncontrolled impervious areas based on, at a minimum, Maryland's hierarchical eight-digit sub-basins;

No changes were made to the GIS data for impervious surfaces during this reporting period.

5. Monitoring locations: locations established for chemical, biological, and physical monitoring of watershed restoration efforts and the *2000 Maryland Stormwater Design Manual*; and

During this reporting period, there were 85 monitoring sites active including the 14 locations required as listed above. The spatial and tabular data for all active and inactive monitoring sites is maintained in the County geodatabase, Monitoring.mdb.

Monitoring Sites - 85

Chemical - 30

Biological – 36

Flow - 9

Physical - 8

Rainfall – 2

A map of all active monitoring locations and table of attributes are included in Appendix C5. The spatial and tabular data for the 14 required monitoring locations (MonitoringSite point feature class) and associated drainage areas (MonitoringDrainageArea polygon feature class), were imported into the MDE geodatabase and submitted with this report.

6. Water quality improvement projects: projects proposed, under construction, and completed with associated drainage areas delineated.

As of the end of this reporting period, there were 19 watershed restoration projects active or completed. The spatial and tabular data for all restoration projects is maintained in the County geodatabase, CIP.mdb.

Watershed Restoration Projects - 19

Completed - 2

Under Construction – 3

Under Design - 14

In February 2018, the designs for five pending projects are anticipated to begin. Maps of the completed, active, and pending watershed restoration project locations and table of attributes are included in Appendix C6. A copy of the County geodatabase was submitted with this report.

D. Management Programs

The following management programs shall be implemented in areas served by Harford County's MS4. These management programs are designed to control stormwater discharges to the maximum extent practicable (MEP) and shall be maintained for the term of this permit. Additionally, these programs shall be integrated with other permit requirements to promote a comprehensive adaptive approach toward solving water quality problems. The County shall modify these programs according to needed program improvements identified as a result of periodic evaluations by MDE.

1. Stormwater Management

An acceptable stormwater management program shall continue to be maintained in accordance with the Environment Article, Title 4, Subtitle 2, Annotated Code of Maryland. Activities to be undertaken by the County shall include, but not be limited to:

- a. Implementing the stormwater management design policies, principles, methods, and practices found in the latest version of the 2000 Maryland Stormwater Design Manual. This includes:
 - i. Complying with the Stormwater Management Act of 2007 (Act) by implementing environmental site design (ESD) to the MEP for new and redevelopment projects;
 - ii. Tracking the progress toward satisfying the requirements of the Act and identifying and reporting annually the problems and modifications necessary to implement ESD to the MEP; and
 - iii. Reporting annually the modifications that have been made or need to be made to all ordinances, regulations, and new development plan review and approval processes to comply with the requirements of the Act.

Under Bill 10-11, Harford County updated Chapter 214 in February 2010 to comply with the Stormwater Management Act of 2007.

During this reporting period, no modifications to ordinances or regulations were necessary to comply with the requirements of the Act.

- b. Maintaining programmatic and implementation information including, but not limited to:
 - i. Number of Concept, Site Development, and Final plans received. Plans that are re-submitted as a result of a revision or in response to comments should not be considered as a separate project;
 - ii. Number of redevelopment projects received;
 - iii. Number of stormwater exemptions issued; and
 - iv. Number and type of waivers received and issued, including those for quantity control, quality control, or both. Multiple requests for waivers may be received for a single project and each should be counted separately, whether part of the same project or plan. The total number of waivers requested and granted for qualitative and quantitative control shall be documented.

Stormwater program data shall be recorded on MDE's annual report database and submitted as required in PART V of this permit.

For this reporting period, the following information was entered into the MDE geodatabase (SWM table) and submitted with this report.

Stormwater Management Program

Concept Plans Received - 48

Site Development Plans Received - 31

Final Plans Received - 38

Redevelopment Project Received - 1

Stormwater Exemptions Issued - 6

Stormwater Waivers Issued – 13

- c. Maintaining construction inspection information according to COMAR 26.17.02 for all ESD treatment practices and structural stormwater management facilities including the number of inspections conducted and violation notices issued by Harford County.

For this reporting period, the following information was entered into the MDE geodatabase (SWM table) and submitted with this report.

Stormwater Management Construction

Construction Inspections - 837

Construction Violations - 140

- d. Conducting preventative maintenance inspections, according to COMAR 26.17.02, of all ESD treatment systems and structural stormwater management facilities at least on a triennial basis. Documentation identifying the ESD systems and structural stormwater management facilities inspected, the number of maintenance inspections, follow-up inspections, the enforcement actions used to ensure compliance, the maintenance inspection schedules, and any other relevant information shall be submitted in the County's annual reports.

Three hundred forty-three stormwater facilities were inspected during this reporting period. Twenty-nine of those facilities were not compliant as of the end of this reporting period. Four of the 16 facilities non-compliant in last reporting period continue to be non-compliant in this reporting period. One of those facilities was actively being repaired at the end of this reporting period. The County continues to coordinate with the property owners for remaining three facilities.

SWM Facilities Inspected for Preventative Maintenance - 343

Compliant – 314

Non-Compliant - 29

During this reporting period, major repairs were completed for 6 facilities.

Major Stormwater Management Facility Repairs - 6

Amyclae Estates Sec 3 Phase 4
Arundel Sand and Gravel
Constant Friendship (Tollgate)
Forest Lakes Sec 6
Henderson Manor
West Property

A summary of preventative maintenance inspections is included in Appendix D1.

2. Erosion and Sediment Control

An acceptable erosion and sediment control program shall continue to be maintained and implemented in accordance with the Environment Article, Title 4, Subtitle 1, Annotated Code of Maryland. Activities to be undertaken by the County shall include, but not be limited to:

- a. Implementing program improvements identified in any MDE evaluation of the County's erosion and sediment control enforcement authority;

On April 30, 2015, MDE approved Harford County's application for continued delegation of the erosion and sediment control enforcement authority through June 30, 2017.

In Fall 2016, MDE reviewed Harford County's erosion and sediment control program. Delegation was approved through June 20, 2018. A copy of the correspondence with MDE is included in Appendix D2.

- b. Ensure that construction site operators have received training regarding erosion and sediment control compliance and hold a valid Responsible Personnel Certification as required by MDE;

Harford County conducts a pre-construction meeting prior to the issuance of grading permits.

Contractors are required to provide a copy of the valid Responsible Personnel Certification for the onsite field supervisor.

- c. Program activity shall be recorded on MDE's annual report database and submitted as required in PART V of this permit; and

For this reporting period, the following information was entered into the MDE geodatabase (ErosionSedimentControl table) and submitted with this report.

Erosion and Sediment Control Program

Active Permits - 165

Disturbed Area – 2,800 acres

Number of Inspections – 3,328

Number of Violations - 514

Number of Stop Work Orders - 65

- d. Reporting quarterly, information regarding earth disturbances exceeding one acre or more. Quarters shall be based on calendar year and submittals shall be made within 30 days following each quarter. The information submitted shall cover permitting activity for the preceding three months.

Fifty-four of the 65 grading permits issued during this reporting period exceeded one acre of earth disturbance. Quarterly reports were submitted as required. The spatial and tabular data for grading permits once acre or more is maintained in the County geodatabase, Grading.mdb.

A map of the grading permit locations and table of attributes are included in Appendix D2. The spatial and tabular data for the grading permit location (QuarterlyGradingPermits point feature class) and attributes (QuarterlyGradingPmtInfo table) were imported into the MDE geodatabase and submitted with this report.

3. Illicit Discharge Detection and Elimination

Harford County shall continue to implement an inspection and enforcement program to ensure that all discharges to and from the MS4 that are not composed entirely of stormwater are either permitted by MDE or eliminated. Activities shall include, but not be limited to:

- a. Field screening at least 100 outfalls annually. Each outfall having a discharge shall be sampled using a chemical test kit. Within one year of permit issuance, an alternative program may be submitted for MDE approval that methodically identifies, investigates, and eliminates illegal connections to the County's storm drain system;

Outfall Screening Program

In 2016, Harford County modified its outfall screening procedure. To improve cost efficiency and to utilize existing County resources, Harford County construction inspectors are performing the initial screening. By using our own inspectors, Harford County anticipates being able to initially screen 200 outfalls per year, twice the minimum requirement.

An individual outfall may undergo initial screenings up to four times, with each screening not to exceed quarterly. If an outfall does not exhibit dry weather flow for all four screenings, it is eliminated from the screening rotation for three years. This procedure has two advantages. The multiple screenings ensure an outfall has a very low risk of illicit discharge, and maximizes the numbers of outfalls screened by eliminating the low risk outfalls from the screening rotation.

Harford County has developed an outfall screening app for inspectors to use that is compatible with their mobile devices (iPads). Targeted outfalls are pre-selected by geographic region with a desk-top exercise and loaded into the app. The app includes a series of drop-down choices to evaluate the condition of the outfall, verify its location, size, and composition, and to determine if there is dry-weather flow. If dry-weather flow exists, the inspector is prompted with a series of drop-down choices to describe the flow. The app allows the inspector to provide any additional comments and to include photographs.

During this reporting period, training was conducted on May 23, 2017 and was attended by 8 individuals.

Outfalls with obvious physical characteristics of suspected pollution (oil sheen, soap bubbles, unusual odor, etc.) are immediately referred to the appropriate enforcement agency or to the County's contractor, Versar, Inc., for testing and source tracking. Outfalls discharging groundwater are eliminated from further testing. All other flowing outfalls are referred to Versar, Inc. on a monthly basis for testing and source tracking. The chemical and/or sonde testing of each outfall include the quantitative parameters; chlorine, color, copper, phenols, turbidity, surfactants (detergents), temperature, pH, conductivity, and dissolved oxygen. Versar conducts the testing and source tracking applying the 2010 Harford County Illicit Discharge Monitoring Program: Site Selection, Screening, and Quality Assurance Protocols. A copy of the protocol is provided in Appendix D3.

It should be noted that outfall inspections are performed year-round. There are instances where the initial screenings performed by County staff are completed in one fiscal year, but the follow-up testing by Versar, Inc. is performed in another fiscal year. The data presented here for this reporting period include 1) Outfalls inspected by County staff with no observed flow, 2) Outfalls with dry-weather flow that were tested and retested by Versar Inc., and 3) Outfalls referred to Versar, Inc. but the follow-up inspection had no observed flow.

Outfall Screening Activities

During this report period, County inspectors performed 150 screenings on 139 outfalls. Although the County did not reach its goal of 200 outfalls, the number of outfalls inspected exceeded the minimum 100 outfalls required. Twenty- eight outfalls were determined to have dry weather flow and were referred to Versar, Inc. for testing and source tracking.

During the report period, Versar, Inc. completed follow-up inspections for all 28 outfalls identified by County inspectors to have dry weather flow. Seventeen outfalls did not have dry weather flow upon the subsequent inspection. The remaining 11 outfalls were tested and re-tested according to protocol. Only one outfall exceeded the action criteria for temperature for the initial test, but not the re-test. Source tracking indicated the likely source of elevated temperature was the asphalt road surface, as the air temperature was 88 degrees. No additional follow-up was required.

A map of the outfalls inspected and table of attributes are included in Appendix D3. The tabular data (IDDE table) were input into the MDE geodatabase and submitted with this report.

Outfalls Screened – 139
No Flow – 128
Dry Weather Flow – 11
Illicit Discharges Detected - 2

During this reporting period, one illicit discharge was discovered and corrected and one was referred to another agency. In the first instance, a County inspector observed what appeared to be kitchen grease below an outfall. County staff traced the most likely source to an inlet near a restaurant in the Festival at Bel Shopping Center, although no grease was observed. A follow-up inspection of the same inlet grate revealed spilled or dumped kitchen grease. County staff contacted the property owner, who, in turn, contacted the tenants regarding grease containment, disposal, and other good housekeeping practices. Subsequent inspections of the outfall have revealed no kitchen grease. In the second instance, a County inspector observed evidence of a failing septic system in a grassed swale. The incident was referred to the Health Department for follow-up.

- b. Conducting annual visual surveys of commercial and industrial areas as identified in PART IV.C.2 above for discovering, documenting, and eliminating pollutant sources. Areas surveyed shall be reported annually;

Hotspot Investigation Program

Random Hotspots

Random hotspots are identified through commercial and industrial surveys conducted by Versar Inc. Versar, Inc. and the Harford County MS4 Office jointly select locations within business parks, industrial parks, or properties identified within the tax records as commercial or industrial. Surveys are completed using datasheets from the *Center for Watershed Protection's Unified Subwatershed and Site Reconnaissance: A User's Manual (2005)*.

Random hotspots with active pollution discharges are reported immediately to the Harford County MS4 Office or Harford County HAZMAT depending on the severity of the discharge. Discharges reported to Harford County HAZMAT are investigated immediately. Non-emergency discharges are investigated by the Harford County MS4 Office within the same business day.

Random hotspots, without active pollution discharge, are reported to the Harford County MS4 Office monthly.

Reported Hotspots

Reported hotspots are identified by citizens or County employees who report an issue via telephone, email or Facebook. Reported hotspots determined as an emergency are forwarded to Harford County HAZMAT. All other reported hotspots are investigated by the Harford County MS4 Office.

Verified Hotspots

The Harford County MS4 Office visits both random hotspots and reported hotspots to verify the site as a hotspot, here forward called a verified hotspot.

Verified hotspots with active NPDES industrial permits or verified hotspots with activities that may require an NPDES industrial permit are forwarded to the MDE Compliance Hotline (866) MDE-GOTO. Verified hotspots that discharge into another jurisdiction's MS4 system are forwarded to that jurisdiction (MD State Highway, City of Aberdeen, Town of Bel Air, City of Havre de Grace).

For each verified hotspot not referred to another jurisdiction, a case is opened and the property owner is contacted by mail. The letter documents the issues and lists the recommended remediation to be completed within a designated timeframe, typically 30 days. Follow-up with the property owner continues until the remediation is completed, and the case is closed.

Hotspot Geodatabase

Harford County developed a geodatabase to more efficiently track the status of hotspot investigations. The location, date and category for all hotspot investigations are entered into the County geodatabase, Hotspot.mdb. For verified hotspots, a case file is opened, and a record is added to a case file for each date and action taken, such as letter to owner, email from

owner, or site visit. The County geodatabase allows for the visual assessment of the locations of hotspot investigations and easily documents open cases for follow-up.

Hotspot Investigation Activities

During this reporting period, 50 sites were inspected and 20 new cases were opened. Seventeen cases were closed, 5 of which were carry-over cases from previous years. Ten cases remained open at the end of this reporting period.

Of the 20 cases opened during this reporting period, 16 were identified during the windshield survey of commercial and industrial sites. One was reported by Maryland Department of the Environment, and 3 were reported by citizens.

The Hotspot Activity Report for this reporting period is provided in Appendix D3.

Harford County Illicit Discharge Inspection Program, 2016 Summary Report, Versar, Inc. (2017) describing windshield survey protocol and findings is provided in Appendix D3.

The MDE geodatabase contains no features classes or tables for hotspot investigations.

- c. Maintaining a program to address and, if necessary, respond to illegal discharges, dumping, and spills;

The Harford County MS4 Office continues to implement and improve initiatives to address illegal discharges, dumping and spills through coordination with Harford County Emergency Services, Harford County Division of Water and Sewer, Harford County Division of Environmental Services and Harford County Health Department.

Illegal Discharges, Dumping and Spills Program

Reporting

The public has several avenues by which to report these activities. The numbers listed below are published in water and sewer bills, the Harford County website and public outreach literature.

Emergency Services (911) and Non-Emergency (410.638.3400)

Both phone numbers are monitored 24 hours a day and answered by trained public safety dispatchers. For spill response throughout the county including the municipalities, the HAZMAT Team responds to each incident.

Office of Watershed Protection and Restoration (410.638.3545)

All reports of illegal discharges, dumping and spills are transferred to the appropriate phone number listed above based on the level of imminent emergency.

You Click, We Fix

(<http://www.harfordcountymd.gov/1737/You-Click-We-Fix>)

Harford County provides a web form for citizens to report issues. Harford County Department of Governmental and Community Relations review the submissions and directs the request to the appropriate agency.

Emergency Services

The HAZMAT Team operates 24 hours a day and consists of 31 certified Hazardous Materials technicians and 5 primary response vehicles. Training occurs continuously throughout the year. The HAZMAT Team responds to each call directed from the public safety dispatcher. Every attempt is made to recover spill materials before the spill reaches a stormdrain or waterway unless weather or terrain prohibits the recovery. All spills that reach a stormdrain or waterway are reported to Maryland Department of the Environment, Emergency Response. All spills that reach a navigable waterway are reported to the National Response Center. A HAZMAT Incident report is created for each response and contains a summary of the actions taken.

Local Emergency Planning Committee (LEPC)

The Local Emergency Planning Committee (LEPC) meets bi-monthly. One of several topics on the agenda includes the review of incidents of illegal discharges, spills and dumping to determine if enforcement action is warranted. The LEPC also conducts the investigative hearings and assesses fines as appropriate.

Division of Water and Sewer

The Harford County Health Department assists the Division of Water and Sewer with sanitary sewer overflows (SSOs). They determine appropriate forms of public notification, identifying downstream users, directing stream testing and assessing adequacy of site cleanup.

Health Department

The Health Department responds to citizen reports of leaking or overflowing septic systems and private sewer lines. Most of these calls are placed directly to the Health Department offices. A portion of citizen reports are routed from Emergency Operations. The Harford County MS4 Office continues to work with the Bureau of Environmental Health to coordinate preventive and clean-up protocols regarding discharges (oil, grease, leaky dumpsters) from restaurants that impact the stormdrain system.

Illegal Discharges, Dumping and Spills Activities

The following is a summary of Harford County's HAZMAT team responses, investigations and enforcement activities related to illegal discharges, dumping and spills that occurred during this reporting period. Beginning in January 2016, the HAZMAT team added a field to their records indicating if the pollutant entered a waterway.

HAZMAT Team Responses

Total responses – 183

Potential water quality impact responses – 66

Incidents where pollutants reached a waterway– 10

Number of Notices of Violation – 3

Fines Assessed - \$2,100

LEPC Meetings

September 21, 2016

November 16, 2016

January 18, 2017

May 21, 2017

Detailed information for HAZMAT responses is included in Appendix D3.

d. Using appropriate enforcement procedures for investigating and eliminating illicit discharges, illegal dumping, and spills. Significant discharges shall be reported to MDE for enforcement and/or permitting; and

e. Reporting illicit discharge detection and elimination activities as specified in PART V of this permit.

For this reporting period, activities for outfall screenings, hotspot investigations and spill response are listed above.

4. Litter and Floatables

This section of the permit requires Harford County to address problems associated with litter and floatables in waterways that adversely affect water quality. Increases in litter discharges to receiving waters have become a growing concern both nationally and within Maryland and cannot be ignored. Harford County needs to evaluate current litter control problems associated with discharges from its storm drain system and develop and implement a public outreach and education program as needed on a watershed by watershed basis.

The Division of Environmental Services implements the County's environmental, solid waste management and recycling programs. This includes managing the following operations: the Harford Waste Disposal Center, the Mulch & Compost operation, the Recycling Transfer Station, the Roadside Litter Control Program, the Used Oil & Anti-freeze Program and the Waste-to-Energy Facility.

The Division of Environmental Services prepared a comprehensive update to the Solid Waste Management Plan for the 2015 – 2024 planning period. The new Plan was introduced by the

County Council under Bill No. 15-004. A public hearing was held on February 17, 2015, and the Council approved the Plan as amended on March 3, 2015. In May 2015, MDE's Land Management Administration completed a review of the Plan and determined that the adopted Plan satisfied the requirements of Section 9-503(a) of the Environment Article and Code of Maryland Regulation 26.03.03. In accordance with Section 9-507(a) of the Environmental Article, Annotated Code of Maryland, the Plan was approved.

At the close of this reporting period, the Division of Environmental Services began a transition period in which the Administration elected to outsource the County's solid waste management services to the Maryland Environmental Service (MES).

- a. As part of Harford County's watershed assessments under PART IV.E.1 of this permit, Harford County shall document all litter control programs and identify potential sources, ways of elimination, and opportunities for overall improvement.

During this reporting period, no watershed assessments were completed. All current and future assessments will include documentation of litter and floatables.

The Litter Control Program consists of staff picking up blown litter at the Harford Waste Disposal Center and along County roadways, as well as cleaning up of dumped trash, recycling and illegal dumpsites throughout the County. Staff also assisted Community Service workers and citizens participating in the Absent Parent Program. During this reporting period, the Litter Control Program reported the following:

Litter Control Program
94,079 lbs of Trash Collected
22,135 lbs of Recycling Collected
794.4 miles Cleaned

The County has a very successful Adopt-A-Road program, whereby County residents or groups of residents adopt a portion of a roadway in their community and agree to collect roadside litter at a specified frequency. The County provides supplies and materials for these residents. During this reporting period, the Adopt-A-Road Program reported the following:

Adopt-A-Road Program

4,662 lbs of Trash Collected
1,668 lbs of Recyclables Collected
71.5 miles Cleaned
115 Adopt-A Road Signed Contracts

Both groups combined collected 494 tires.

- b. Within one year of permit issuance, as part of the public education program described in PART IV.D.6., Harford County shall develop and implement a public education and outreach program to reduce littering and increase recycling. This shall include:
 - i. Educating the public on the importance of reducing, reusing, and recycling;
 - ii. Disseminating information by using signs, articles, and other media outlets; and
 - iii. Promoting educational programs in schools, businesses, community associations, etc.

Harford County's Office of Recycling currently administers a public education and outreach program to reduce littering and increase recycling.

Waste reduction is the preferred method in the solid waste management hierarchy. Reductions in waste generation lessen the burden of solid waste management by decreasing the amount of material entering the system. The waste reduction plan reflects a multi-faceted approach.

The curbside collection of waste and recyclables is available to residents and services are provided by local trash collection companies. Residents who do not subscribe to a curbside collection service may drop-off material at the HWDC. A 2014 phone survey indicated about 85 percent of all residents recycle with about 80 percent subscribing to a curbside collection program and about four percent self-hauling to the HWDC.

Media Outlets

The County has consistently spent considerable resources targeting County residents with various forms of advertisement through local radio, newspapers, magazines, and website ads. In addition, the Office of Recycling maintains a website, www.Harfordrecycles.org which includes in-depth information on the importance of waste reduction and information regarding all the recycling programs available for County residents. The website is updated frequently to highlight seasonal programs and events such as Christmas tree recycling and Grass cycling. The Harford County Reuse Guide is maintained on this website as well as a list of frequently asked questions. Brochures are available for Harford County residents both on the website and in print. Topics include Grass cycling, Single Stream Recycling, Business Recycling, Textile and Electronics Recycling, used motor oil and antifreeze recycling General Recycling Available at the HWDC, and Mulch and Compost Information.

Social media has become a critical tool for outreach and education. The Office of Recycling maintains an active Facebook page <https://www.facebook.com/HarfordCountyRecycling> which encourages communication and engagement with residents and businesses concerning waste reduction and recycling opportunities. The Facebook page allows the Office of Recycling to post educational information, address questions, and promote recycling. Contests and giveaways are employed to encourage participation and discussion on the page.

School Programs

Harford County Public Schools recognizes the importance of recycling, and as such every Fourth Grade science class in the Harford County Public School system provides lessons designed to teach the importance of waste reduction and recycling. The Office of Recycling provides presentations, lessons, and activities to accompany the curriculum. In addition, the Office of Recycling acts as a resource for middle and high schools. This takes the form of providing teacher training and materials, presentations and lessons for students, and assistance in special recycling events. School groups are also encouraged to visit the HWDC to see landfilling and recycling in action.

Community Programs

Community outreach is another important aspect of public education. Community groups are encouraged to contact the Office of Recycling and schedule presentations and tours of the

HWDC. In addition, the Office of Recycling participates in local special events, expos, fairs, and business events to highlight recycling.

Business Program

Businesses are also encouraged to recycle through the Partners in Recycling program. This program recognizes businesses who are recycling with a display sticker, a listing on our website, and inclusion in media advertising. The Office of Recycling provides assistance to businesses looking to recycle in the form of waste assessments, educational materials, and training sessions in waste reduction and recycling. The Office of Recycling also reaches out to businesses and offers on-site visits to discuss business recycling opportunities and the result on their bottom-line. Businesses that are recycling are encouraged to apply for recognition through the annual Business Recycling Awards program. Awards are given to a small business, a large business, and a property management company who demonstrate a commitment to recycling and source reduction in their organization. Award winners receive a plaque during a public award ceremony, and are included in an announcement through various media outlets.

Business recycling in Harford County is strictly voluntary. Unfortunately, many businesses do not recycle which is evident by significant quantities of recyclables observed entering the landfill for disposal. Whenever large quantities of recyclables are received, the County attempts to track the origin of the load and pinpoint the business that generated the recyclables. Some conversations with these business owners indicate that (1) the local trash collection companies market their services in ways that do not lessen the business owner's costs for recycling and/or (2) it is corporate policy not to recycle unless local government laws require recycling.

Parks and Recreation Programs

As part of the Harford County Land Preservation, Parks, and Recreation Plan, the Department identified recycling and other conservation practices as part of the overall strategic plan. Working in partnership with Harford County Public Schools, Parks and Recreation began a pilot program to implement single stream recycling at all public school stadiums and then expanded the program to include all school sites as part of a County-wide implementation at all Department parks and facilities. As a result of the successful partnership with Harford County Public Schools, the Department of Parks and Recreation fully implemented single stream recycling at all parks, centers, offices, sports fields, and special events. Working in cooperation with the Harford County Office of Sustainability and the Division of Environmental Services,

Recycling Office, Parks and Recreation purchased 400 additional recycling containers, lids, and signage to implement the “Recycling Just Like at Home” program.

Computer and Electronic Program

The proliferation of computer and consumer electronics has resulted in continued growth in this portion of the U.S. waste stream. Electronic recyclables include computers, non-CRT computer monitors, computer peripherals, non-CRT televisions, stereophonic equipment, VCRs, DVRs, cellphones, and similar electronic products. Harford County has a contract in place with an eCycling vendor. Harford County intends to continue to offer this service to County residents and businesses in the future.

Household Hazardous Waste Program

Household hazardous waste is collected from residents on a specific day several times a year. To be accepted, all items must be in containers with quantities normally found in retail stores. Items accepted included oil-based paints and stains, herbicides, pesticides, mercury thermometers, mercury containing thermostats, fluorescent light tubes and CFLs, pool chemicals, caustic cleaners, acids, and other items deemed appropriate.

- c. Evaluating annually the effectiveness of the education program.
- d. Submit annually, a report which details progress toward implementing the public education and outreach program. The report shall describe the status of public outreach efforts including resources (e.g., personnel and financial) expended and the effectiveness of all program components.

During this reporting period, the Office of Recycling reported the following:

Recycling education and outreach to 2,998 County residents
5 tours of the Harford Waste Disposal Center
13 school presentations9 public outreach events
Published 19 advertisements in local papers, magazines, mailings, and websites

The success of the recycling education and outreach program is measured by the compilation and the submittal of two annual reports to the MDE. These include the Maryland Recycling Act Report and the County Source Reduction (SR) Credit Report.

Although Harford County has been a leader in its recycling rates, significant amounts of recyclables are observed daily within the solid waste loads disposed of at the landfill. The County has spent over \$300,000 annually in its public outreach and education programs during the past planning period. It is believed that, no matter how many resources are utilized in public outreach and education, at some point a plateau is reached in its effectiveness. No matter how much effort is put into this endeavor, there will always be residents who refuse to participate in recycling. Funding, education, and outreach alone cannot change everyone's behavior.

5. Property Management and Maintenance

- a. Harford County shall ensure that a Notice of Intent (NOI) has been submitted to MDE and a pollution prevention plan developed for each County-owned municipal facility requiring NPDES stormwater general permit coverage. The status of pollution prevention plan development and implementation for each County-owned municipal facility shall be reviewed, documented, and submitted to MDE annually.

Notice of Intent (NOI) for County Owned Property

NOIs and pollution prevention plans for all County owned properties requiring coverage under the general stormwater permit (12SW) have been submitted and approved.

County Owned Property 12SW General Permit

Abingdon Highway Maintenance Facility – 12SW1271

Fallston Parks and Recreation Maintenance Facility – 12SW2095

Hickory II Highway Maintenance Facility – 12SW1714

Jarrettsville Highway Maintenance Facility – 12SW2474

Jarrettsville Parks and Recreation Maintenance Facility – 12SW2094

Public Schools Maintenance Facility – 12SW2084

Scarboro Landfill – 12SW0028

Sod Run Waste Water Treatment Plant – 12SW1727
Whiteford Highway Maintenance Facility – 12SW1847

Annually, the Harford County MS4 Office sends notices to each facility with a 12SW permit to review the individual SWPPPs and to provide any necessary updates. Each facility is required to perform all necessary inspections and trainings and to keep the records on site.

As requested by Highways and Parks & Recreation, the MS4 Office assists in conducting annual inspections of those facilities. During this reporting period, the MS4 office assisted in completing annual inspections for five facilities (Appendix D5). The MS4 Office along with each facility manager inspected the site and reviewed the pollution prevention plan for completeness. Minor housekeeping improvements were noted and implemented. It should be noted that Abingdon Highway Maintenance Facility was inspected in July 2017 so the inspection report will be provided in the next reporting period.

Annual Pollution Prevention Inspections

Hickory II Highway Maintenance Facility – 12SW1714
Jarrettsville Highway Maintenance Facility – 12SW2474
Whiteford Highway Maintenance Facility – 12SW1847
Fallston Parks and Recreation Maintenance Facility – 12SW2095
Jarrettsville Parks and Recreation Maintenance Facility – 12SW2094

A map of the County owned properties with 12SW permits and table of attributes are included in Appendix D3. The spatial and tabular data (MunicipalFacilities point feature class) were input into the MDE geodatabase and submitted with this report.

- b. The County shall continue to implement a program to reduce pollutants associated with maintenance activities at County-owned facilities including parks, roadways, and parking lots. The maintenance program shall include these or MDE approved alternative activities:
 - i. Street sweeping;
 - ii. Inlet inspection and cleaning;
 - iii. Reducing the use of pesticides, herbicides, fertilizers, and other pollutants associated with vegetation management through increased use of integrated pest management;
 - iv. Reducing the use of winter weather deicing materials through research, continual testing and improvement of materials, equipment calibration, employee training, and effective decision-making; and
 - v. Ensuring that all County staff receives adequate training in pollution prevention and good housekeeping practices.

The County shall report annually on the changes in any maintenance practices and the overall pollutant reductions resulting from the maintenance program. Within one year of permit issuance, an alternative maintenance program may be submitted for MDE approval indicating the activities to be undertaken and associated pollutant reductions.

During the report period, Harford County Highways Division continued its road maintenance operations to ensure public safety in a cost-efficient manner.

During the previous reporting period, Harford County Highways Division implemented a new system to maximize the efficiency of equipment usage. The *PreCise*® *Mobile Resource Management* is designed to track the location of all vehicles to maximize equipment uptime, redeploy equipment where it will be more effective, track salt usage and adhere more easily to environmental policies. The new system can produce reports for vehicle travel patterns, down time, break-downs and travel speed.

Street Sweeping

Harford County maintains 1,071 miles of roadway. Approximately 80% of all public streets are swept annually with a mechanical brush vacuum truck. Additionally, certain major collector roads may be swept monthly. During this reporting period, 2,627.25 lane miles of hard surface roads were swept. The street sweeping practice collected 2,940 tons of material. Material collected during street sweeping is disposed of in the local landfill or maintenance yard. Dirt roads are not swept.

Street Sweeping

2,627.25 lane miles

2,940 tons

Inlet Inspection and Cleaning

Inlets are scheduled to be inspected and cleaned at a minimum of every three years. Inlets may be cleaned more frequently if needed. There are approximately 12,000 inlets throughout Harford County. Inlets are assigned to each of the four Highways Districts, according to snow routes. All inlets along a specified snow route are inspected and the snow routes are rotated over a three-year period. Inlets may be cleaned with vacuum sweepers, backhoes, or manually. During this reporting period, 6,687 inlets were inspected and were cleaned as needed resulting in 43 tons of material removed from the stormdrain system.

Inlet Inspections and Cleaning

6,687 inlets

43 tons

Vegetation Management

Mowing and trimming are the primary means of managing roadside vegetation. During the report period, Harford County Highways Division mowed 1,749.3 road miles, trimmed 619,863 feet of guardrail, and trimmed around 26,997 road signs. Additionally, the County employs contractors to mow medians, mow County-owned stormwater management ponds, trim around guardrails and remove trees. County-owned parks and recreation complexes are maintained by mowing and trimming.

The County ensures pesticides and fertilizers are applied appropriately by requiring all contractors who perform such work to be licensed by Maryland Department of Agriculture in aquatic weed control, right-of-way weed control and to have a Professional Fertilizer Application License. The County does not track herbicide and fertilizer use by contractors, as the contractors must report this information to Maryland Department of Agriculture annually.

County-owned stormwater wet ponds are treated with Aquashade as needed for algae control. The County also applies weed control at Recreation & Parks facilities if needed. Chemical application data for County applied algaecides and herbicides (ChemicalApplication table) was input into the MDE geodatabase and submitted with this report.

Deicing

All dump trucks are calibrated to deliver between 300 and 550 pounds of salt per land mile. County staff evaluates road conditions for each storm to determine the most effective treatment for the conditions of the particular storm and for the area of the County affected. During this reporting period, Harford County purchased equipment to be able to pre-treat the roadways with a brine solution. No brine was applied during this reporting period. The County will test the brining equipment during the next reporting period. Salt usage for the winter of 2016 – 2017 was 6,128.47 tons. Salt usage (ChemicalApplication table) was input to the MDE geodatabase and submitted with this report.

Employee Training

Harford County Highways Division and the Department of Parks and Recreation conduct monthly safety training for its staff. At a minimum, the topics of spill response and reporting and good housekeeping practices are covered annually. Equipment operators are trained and tested annually. Training dates, locations and number of attendees are provided in Appendix D5.

Employee Training

Number of training sessions: 17

Number of employees receiving training: 130

6. Public Education

Harford County shall continue to implement a public education and outreach program to reduce stormwater pollutants. Outreach efforts may be integrated with other aspects of the County's activities. These efforts are to be documented and summarized in each annual report. The County shall continue to implement a public outreach and education campaign with specific performance goals and deadlines to:

- a. Maintain a compliance hotline or similar mechanism for public reporting of water quality complaints, including suspected illicit discharges, illegal dumping, and spills.

Reporting mechanisms are described in Section D. 3. c.

- b. Provide information to inform the general public about the benefits of:
 - i. Increasing water conservation;
 - ii. Residential and community stormwater management implementation and facility maintenance;
 - iii. Proper erosion and sediment control practices;
 - iv. Increasing proper disposal of household hazardous waste;
 - v. Improving lawn care and landscape management (e.g., the proper use of herbicides, pesticides, and fertilizers, ice control and snow removal, cash for clippers, etc.);
 - vi. Residential car care and washing; and
 - vii. Proper pet waste management.

Public Outreach Events

In July 2016, the Harford County MS4 Office formed a core committee to develop the Harford County Watershed Stewards Academy (WSA). The committee consisted of staff from the

University of Maryland Sea Grant Extension, Harford County Parks and Recreation, and Harford County Planning and Zoning. The first task for the core committee was to create a steering committee of professionals in the community with varying areas of expertise whose goals were to develop the WSA. The steering committee consisted of the core members and individuals from Harford Community College, Harford County Public Schools, Izaak Walton League, Harford Soil Conservation District, Harford County Master Gardeners, Susquehannock Wildlife Society, Mountain Christian Church, Harford Land Trust, Ecotone, Inc. and Master Watershed Stewards from Cecil County. The steering committee met monthly from September 2016 through June 2017. The purpose of the WSA is to provide localized community outreach and assist with the implementation of best management practices focused on stormwater management and improving local water quality. Participants successfully completing the academy will be trained Master Watershed Stewards who will become community leaders that will help promote Harford Stream's mission to improve stream health, increase water quality awareness, encourage actions to reduce human impacts to water quality, and engage communities to take actions to improve water quality.

In September 2016, the Harford County MS4 Office was invited to participate in Aberdeen Proving Ground's (APG), Pollution Prevention Open House. The target audience was the workforce and residents at APG. During this event, staff promoted the importance of healthy watersheds, the need for proper erosion and sediment control measures, the impacts of impervious surfaces, the importance of the Critical Area Program, the benefits of recycling, native plants, proper lawn care, best management practices, and rain gardens, the importance of proper disposal of hazardous household materials and pet waste, along with additional nonpoint source pollution and stormwater related materials. Staff offered promotional items that included pencils, and environmentally themed toys, balls and recycled bags. Staff engaged the public in conversation about relevant environmental and watershed issues and enticed the youth with watershed and insect puzzles, games and water conservation coloring books.

In October 2016, the Harford County MS4 Office installed a public pet waste station at the Mount Royal storm water management facility located in Aberdeen.

In November 2016, the Eden Mill Nature Center (EMNC) held their annual Fall Fest. The Fall Fest is fun for the whole family. Visitors were able to visit the nature center, the educational garden area, and the historic grist mill museum. All participants were given a passport scavenger hunt card and were able to engage with the Phoenix Wildlife Center, the Natural History Society of Maryland, Harford Land Trust, and Master Gardeners' while learning about native animals and

plants. Some other activities included were pumpkin chunkin', gourd hunting, corn grinding, interacting with farm animals, playing in a leaf pile, and various games. This event reached over 2,000 people.

In May 2017, the Harford County MS4 Office launched the Harford Streams Summer Adventure 2017. The Summer Adventure Program's intent is to encourage the community to explore the County's local waterways, to understand their importance as part of the Bay's ecosystem, and to promote awareness and support to protect them. Staff created an online web app at <https://harfordgis.maps.arcgis.com/apps/StoryMapCrowdsource/index.html?appid=7a6b55c7cbe84cfd9594a792974fa04a> for uploading photos, entering locations using GIS, and describing actions conducted at each site. Flyers, palm cards, and yard signs were distributed to numerous locations throughout the County including the Harford County Libraries and reading program bags, Harford County Schools, state parks, various stores, restaurants, and businesses, the Bel Air Town Run, the Harford County Farm Fair, and the Bar-B-Q Bash. Twenty waterways located throughout the County were identified to explore. Participants were required to visit and submit a selfie to the online web app to be eligible for prizes and drawings. Participants who visited seven waterways earned a Summer Adventure T-Shirt. Participants who visited 11 waterways were entered into a drawing for a pontoon boat trip for 15 people. Participants who visited 15 waterways were entered into a drawing for a family membership to the Maryland Science Center. County citizens of all ages were able to register for the adventure program. The program was open all summer and ran through September 4, 2016. Participation more than tripled from the previous year with over 600 participants registering for the event.

In an attempt to reach a larger audience to promote stream health awareness, a one day Poker Run was added to the Summer Adventure. 81 participants registered with County staff at Harford Glen Environmental Education Center and received a Harford Streams Summer Adventure t-shirt. Participants were then required to visit 5 designated streams, take a selfie at the site, draw a playing card, and return to Harford Glen in order to be eligible for additional prizes. These prizes included a Yeti Tundra 65 cooler, Yeti cups, Aberdeen Ironbirds tickets, and a sky box for 30 people to attend an Aberdeen Ironbirds game.

In June 2017, the Harford County MS4 Office participated in the Upper Western Shore Wade-In held at the Anita C. Leight Estuary Center. During this event, staff promoted the importance of healthy watersheds, the need for proper erosion and sediment control measures, the impacts of impervious surfaces, the importance of the Critical Area Program, the benefits of recycling,

native plants, proper lawn care, best management practices, and rain gardens, the importance of proper disposal of hazardous household materials and pet waste, along with additional nonpoint source pollution and stormwater related materials. Staff utilized this time to kick off Harford County Streams Summer Adventure program. Staff offered promotional items that included pencils, and environmentally themed toys, balls and recycled Frisbees. Staff engaged the public in conversation about relevant environmental and watershed issues and enticed the youth with watershed and insect puzzles, games and water conservation coloring books.

In June 2017, the Harford County MS4 Office attended and presented at the Sustainable Grounds Maintenance Regional Workshop hosted by Harford County Public Schools. Staff gave a presentation on the maintenance of stormwater management facilities which emphasized the required routine facility maintenance, the importance of coordinating with property owners, and the need not only to acquire set of stormwater management plans for the property but also to understand how to read those plans.

In May 2017, the Harford County MS4 Office joined Visit Harford at Southern Sol Consignment shop in Norrisville, Maryland to promote the Summer Adventure Program and the Watershed Stewards Academy. Staff engaged the public in conversation about relevant environmental and watershed issues and encouraged participation in the County offered programs.

In June 2017, the Harford County MS4 Office staff were guests on the Harford's Edge Radio Show at WAMD Commercial Radio station in Aberdeen, Maryland. The goal of the interview was to provide an overview of the environmental programs the MS4 Office administers. Topics discussed included the Harford Stream Summer Adventure, Watershed Stewards Academy, Restoration Plans, Watershed Explorer App, and current stormwater retrofit and stream restoration projects.

In May 2017, the Harford County MS4 Office assisted the Department of Planning and Zoning with planning and implementing a native plant demonstration garden at the Unitarian Universalist Fellowship of Harford County in Churchville, Maryland. The County will use the project for demonstration purposes to promote conservation landscaping and the use of native plants to improve water quality.

School Activities

During this reporting period, the Harford County MS4 Office met several times with the Environmental Club at Forest Hill Elementary School (FHES) to work with the students in beautifying and cleaning up the rain gardens on the school campus. This time was also used as an opportunity to educate the students on rain garden function, the importance of native plants, and the role they play with pollinator species. Staff also assisted the teachers and students at FHES with the Maryland Green Schools Award Program. This is a nationally recognized program allows schools and their communities to evaluate their efforts in environmental sustainability. Participating schools empower youth to make changes to reduce environmental impact, encourage sustainability and foster environmental literacy.

In September 2016, the Harford County MS4 Office coordinated with Emmorton Elementary School staff to receive assistance with officially naming Wheel Creek. The County conducted some preliminary research on the area in and around the Wheel Creek watershed and forward that information to the students involved with the project.

Harford County MS4 Office, Harford County Parks and Recreation, Harford Glen Environmental Center, and Harford County Public Schools partnered to administer Explore and Restore Harford Streams (ERHS) program during the 2016-2017 school year. The program goals were to connect Harford County students to their local stream, making them aware of their impact on watersheds and empower them with the knowledge to make positive environmental changes through personal and civic action. The program was intended to help Harford County meet Maryland Environmental Literacy Standards, contribute to the goals of the 2014 Chesapeake Bay Watershed Agreement by providing Meaningful Watershed Educational Experiences (MWEEs) to 2,270 students, and support the Sustainable Schools Outcome of the Bay Agreement by increasing the number of schools in the region that reduce the environmental impact of their buildings and grounds on their local watershed.

The ERHS program utilized MDNR stream education materials with students in 4th and 7th grades as well as high school environmental science students. Harford County 4th grade students participated in an outdoor stream investigation experience focusing on assessing their campus stream for biotic, chemical, and stream corridor health. Harford County 7th grade students participated in an outdoor streams investigation experience focusing on a more comprehensive chemical stream assessment, a macroinvertebrate assessment, a stream corridor and physical habitat assessment as well as an introductory geomorphology

assessment. Harford County high school environmental science students participated in an outdoor stream investigation experience including comprehensive biotic, chemical, and stream corridor assessments. These students also set up permanent cross sections on each campus stream to monitor stream shape, flow, and volume, and to quantify and track soil erosion rates from stream banks over time.

Each student attended a downstream field trip either to the Anita C. Leight Estuary Center or Harford Glen and conducted stream assessments to compare and contrast their findings and relate them to watershed issues. Data that was collected was entered into the Maryland Statewide Watershed Report Card.

Two days of professional development (PD) were provided for participating Harford County teachers. One day of PD was devoted to training teachers on how to conduct chemical, biological, stream corridor, and geomorphology assessments, and day two of PD trained teachers how to identify and implement an action project on the school campus that would improve downstream water quality.

The table below indicates the outcomes of the Explore and Restore Harford Streams Program.

Number of participating schools	11
Number of participating students	2,270
Number of participating teachers	36
Number of student field days held	80
Number of action projects completed	10

In February 2017, Harford County MS4 Office gave presentations to the Environmental Science classes at Edgewood High School in support of the ERHS program. The presentations emphasized the goals of the ERHS program and the student's role in achieving the goals, the importance of healthy streams, good water quality, forested stream buffers, the need to monitor water quality, aquatic insects, and stream geomorphology and impacts of stormwater runoff on receiving waters and biological communities.

In February 2017, Harford County MS4 Office conducted a tour of the Wheel Creek Stream Restoration project for the Environmental Science Class at Harford Community College. The tour occurred while active stream construction was underway on the mainstem of Wheel Creek. Students were able interact with the project design engineer, construction foreman,

construction inspector and equipment operators and gain a better understanding of the construction process and stream restoration efforts being implemented in the watershed.

In March 2017, the Harford County MS4 Office participated as a judge and mentor for the St. Stephen School annual science fair. Activities included classroom presentations on types of experiments to perform, principles of the scientific method, ways to effectively collect and display data and communicate results.

In May 2017, Harford County MS4 staff worked alongside seventh graders at Edgewood Middle School to plan and implement the student driven action project on the school campus. This action project was in support of the ERHS program, and the students elected to enhance the low mow area of the school by planting 400 native perennials and planting and mulching 4 native trees.

In May 2017, Harford County MS4 Office worked with the fifth grade students at FHES to create a meadow on the school campus. The goal of the project was to decrease the amount of mowing on school grounds by eliminating turf grass and replacing with a meadow planted with native perennials and pollinator seed mixes. Before the meadow was planted, students conducted soil compaction tests to determine if the soils were suitable for planting and entered the data in an online collector app created by County staff. Staff and students then planted over 1000 native perennials along with a pollinator seed mix to create the meadow.

In June 2017, the Harford County MS4 Office conducted an aquatic insect demonstration for preschool students at North Harford Elementary School. Staff utilized preserved specimens from the County's reference collection and live specimens collected from Falling Branch, a tributary to Deer Creek to demonstrate the importance of aquatic communities. The discussion included explanations of insect life cycles, food webs, ecosystems and watersheds, what they are and why they are important. The discussion explained how everyday human activities and land use changes impact our watersheds and water quality in addition to stressing what individuals can do to improve water quality.

Miscellaneous Outreach

In July 2015, the Harford County MS4 Office began utilizing Harford County Streams – Green Choices, Healthy Streams Facebook Page to inform, engage and encourage support for protecting local waterways. During this reporting period, Watershed Protection and Restoration staff reported the following:

Facebook Insights

948 Total Page Likes

4,418 Total Reach

9,050 Total Impressions

In September 2016, the Harford County MS4 Office attended the Business Park Leaders' Breakfast coordinated by the Harford County Office of Economic Development. Staff provided an overview of the goals and mission of the Watershed Protection and Restoration Office and explained how the office may play a role in addressing any stormwater or environmental issues and concerns property owners may have moving forward.

In October 2016, the Harford County MS4 Office was invited to speak at Country Garden Club of Harford County's meeting. The presentation focused on the goals and mission of the Watershed Protection and Restoration Office and how the office utilizes many aspects of gardening to improve stream health, to decrease the impacts of stormwater runoff and to educate the public on the importance of native plants and the problems associated with non-native and invasive plants.

In January 2017, the Harford County MS4 Office assisted with the PD for teachers that participated in the ERHS program. Staff conducted presentations that provided the teachers guidance on interpreting the data results collected by the students and direction on how to develop and implement student driven action projects on the school campuses.

In February 2017, the Harford County MS4 Office provided a general overview of the Watershed Protection and Restoration program to the inspectors in the DPW's Construction Management Group. The overview detailed what the MS4 is and what WPR staff do to meet the MS4 requirements, with a focus on capital improvement projects.

In February 2017, Harford County MS4 Office conducted a tour of the Wheel Creek Stream Restoration project for the teachers from Harford Glen Environmental Educational Center. The tour occurred while active stream construction was underway on the mainstem of Wheel Creek. The teachers were able to interact with the project design engineer, the equipment operators and the construction foreman and inspector to gain a better understanding of the construction process and stream restoration efforts being implemented in the watershed. The downstream reach of Wheel Creek is in Harford Glen, and these teachers routinely conduct

monitoring projects in the stream with the students. Being able to see firsthand the how stream restoration project was designed and constructed has proven to be very beneficial for these teachers and will enable them to translate this knowledge to their students.

In February 2017, the Harford County MS4 Office gave a presentation at the Waterways Advocacy Community Meeting sponsored by the Joppa Development and Heritage Corporation. The presentation provided an overview of the development, goals and mission of the Watershed Protection and Restoration program. This included a history of the Clean Water Act, an overview of the MS4 Permit and how the County is meeting those requirements, a summary of current restoration plans, watershed assessments and capital improvement projects, a summary of the water quality monitoring efforts, water quality standards and TMDLs, an overview the various outreach initiatives, and provided contact information for the appropriate personnel should any environmental issue arise.

In May 2017, the Harford County MS4 Office was invited to speak at the Upper Western Shore Tributary Team meeting hosted at the Anita C. Leight Estuary Center. The presentation focused on the goals and objectives of the Watershed Stewards Academy (WSA) program, Harford Streams Watershed Explorer App, Harford Streams Interactive Project Map, and Harford Streams Summer Adventure 2017. The presentation was well received with follow up discussions and a question and answer period.

In May 2017, the Harford County MS4 Office was invited to speak at the Harford County Master Gardner's monthly meeting at the Forest Hill University of Maryland Extension office. The presentation provided an overview of the goals and mission of the Watershed Protection and Restoration Office. This included an explanation of the MS4 program, impacts of impervious surfaces on stormwater runoff, hydrology, and stream health, described the WSA, Summer Adventure, Watershed Explorer App initiatives, and described various outreach efforts with the students and teachers in the HCPS. Staff also emphasized how the office utilizes many aspects of gardening to accomplish its goals and to educate the public on the importance of native plants and the problems associated with non-native and invasive plants.

Anita C. Leight Estuary Center

The Anita C. Leight Estuary Center (ACLEC) is a Harford County Department of Parks and Recreation facility and is a component of the Chesapeake Bay National Estuarine Research

Reserve (CBNERR). Otter Point Creek Alliance (OPCA) is the non-profit organization of the ACLEC dedicated to supporting the ACLEC's and CBNERR's mission to increase the awareness, understanding, and appreciation of estuarine ecosystems through research, monitoring, and education. The OPCA efforts include fundraising, securing volunteers, sponsoring special events and aiding staff in implementing the CBNERR's Management Plan. During this reporting period, the Harford County MS4 Office continued to serve on the board of directors for the Anita C. Leight Center's Otter Point Creek Alliance.

During this reporting period, the ACLEC reached 924 students and the general public through outreach events that included Earth Day events, APG Pollution Prevention Fair, Arbor Day Festival, World Wetlands Day, Harford Wade-In, elementary school outreach programs on Chesapeake Bay Wildlife, and environmental festivals at the National Aquarium and Masonville Cove Environmental Center.

ACLEC staff conducted numerous watershed education field trips and served 3,129 students in grades 2 through college. These field trips included the Otter Point Creek Environmental Survey, Marsh Ecology, Chesapeake Bay Ecology, Explore and Restore Harford Streams, Envirothon, Wetland Ecology and SAV and the Bay. The ACLEC also held Teachers on the Estuary professional development workshop for educators that aided 96 participants.

ACLEC staff sponsored an evening lecture series called 'Nature and Nosh' and brought in speakers to discuss topics such watershed restoration project, estuarine and tidal fresh fish species, fish ecology, freshwater ecosystem health and SAV in the Chesapeake Bay , attracting an adult audience of 151.

ACLEC volunteers contributed 261 hours towards stewardship projects that included the removal of invasive plants, the annual Marsh Clean Up, participating in the NOAA Marine Debris Canoe Program, shoreline clean up, growing and planting bay grasses, planting native plants in the Critical Areas, and E-cycling.

ACLEC staff conducted numerous kayak, canoe and pontoon boat trips along Winters Run, Otter Point Creek and Bush River that were family friendly experiences focusing on an array of watershed, estuarine, birding and Chesapeake Bay related topics. These trips reached 525 participants.

CBNERR staff and ACLEC staff, along with a dedicated corps of volunteers who contributed approximately 136 hours, conducted various physical, biological and chemical monitoring

efforts in Otter Point Creek and its tributaries. The teams completed a physical stream assessment on HaHa Branch and collected and analyzed discrete water samples, juvenile fish, SAV and zooplankton.

The information below summarizes the number of people reached during each of the educational opportunities available through the ACLEC in an attempt to evaluate the effectiveness of the environmental programs. A table detailing each activity is included in Appendix D6.

Number of People Reached (3093)

General Public – 1952

Elementary, Middle and High School Students – 3129

Organized Groups – 282

During this reporting period, staff continued to participate on the Stream Restoration Monitoring Sub-Committee sponsored by the Maryland Water Monitoring Council (MWMC). The MWMC serves as a statewide collaborative body encouraging effective collection, interpretation, and dissemination of environmental data and strives to improve communication within the Maryland water monitoring and management community regarding issues, policies, and resource management. The mission of the Stream Restoration Monitoring Sub-Committee is to provide a forum for the exchange of data and information about the effectiveness of stream restoration practices in Maryland, to coordinate among those involved with stream restoration monitoring throughout the state and to communicate stream restoration monitoring results. The group is made up of representatives from county and state agencies, environmental consulting firms, practitioners, and academia with diverse experience, knowledge, and expertise in the applying monitoring to stream policy and management.

Eden Mill Nature Center

The Eden Mill Nature Center (EMNC) is a Harford County Department of Parks and Recreation facility located in the Piedmont Plateau along the mainstem of Deer Creek. EMNC provides a variety of resources to encourage environmental education and outdoor recreation for people of all ages and is dedicated to developing a greater awareness and appreciation to the natural and historical resources of the area.

EMNC staff reached 589 people through guided canoe tours along Deer Creek and Big Branch, a tributary to Deer Creek. The EMNC is equipped with a handicapped accessible canoe launch which makes the river accessible for everyone.

EMNC staff conducted various week long nature camps throughout the summer reaching 204 children ages 6 – 11. The camps focused on hiking the trails, wetlands and meadows, feeding and working with live animals in the nature center, monitoring Monarch butterflies, studying insects, macroinvertebrates and pollinators, understanding the water cycle and water quality, exploring the park, learning from Master gardeners, performing experiments, and making crafts with nature related themes.

EMNC staff conducted a streams survey in Deer Creek with children and adults. Participants learned about the journey of water as it flows from its source, to Deer Creek and on to the Chesapeake Bay. Participants identified plants, macroinvertebrates, fish and amphibians and learned how plant and animal life changes with varying water quality conditions.

EMNC staff conducted wetland explorations with children and adults in which the focus was to learn about wetlands, to understand their importance and how they functions, and to determine the types of plants and animals that live in a wetland.

EMNC had 925 volunteers that contributed 8161 hours to support the nature center activities, special events and meetings.

During this reporting period, EMNC reached 7408 people that participated in the various nature center activities, camps, programs, special events and meetings.

Office of Drug Control Policy

The Harford County Office of Drug Control Policy (HCODCP) in conjunction with the Harford County Sheriff's Department, Maryland State Police, Havre de Grace Police Department and the U.S. Drug Enforcement Administration hosted periodic Prescription Drug Take Back events for the safe collection of unused or expired medications so that they may be disposed of safely and without harm to the environment.

During this reporting period, the HCODCP collected 8,406 pounds of unwanted medications. The medications were collected from six permanent drop-off boxes and from three events. The medications were delivered to an incinerator for proper disposal.

- c. Provide information regarding the following water quality issues to the regulated community when requested:
 - i. NPDES permitting requirements;
 - ii. Pollution prevention plan development;
 - iii. Proper housekeeping; and
 - iv. Spill prevention and response.

The regulated community consists of businesses and industries that have been issued permits by MDE. If requested by the regulated community, the Harford County MS4 Office will provide MDE's document, *Stormwater Pollution Prevention Guidance* and refer the business or industry directly to MDE for further guidance. If Harford County determines that a business or industry does not have an NPDES permit, but engages in activities that should be permitted, that information is forwarded to MDE for further action.

E. Restoration Plans and Total Maximum Daily Loads

In compliance with §402(p)(3)(B)(iii) of the CWA, MS4 permits must require stormwater controls to reduce the discharge of pollutants to the MEP. By regulation at 40 CFR §122.44, BMPs and programs implemented pursuant to this permit must be consistent with applicable WLAs developed under EPA approved TMDLs (see list of EPA approved TMDLs attached and incorporated as Attachment B).

Harford County shall annually provide watershed assessments, restoration plans, and opportunities for public participation, and TMDL compliance status to MDE. A systematic assessment shall be conducted and a detailed restoration plan developed for all watersheds within Harford County. As required below, watershed assessments and restoration plans shall include a thorough water quality analysis, identification of water quality improvement opportunities, and a schedule for BMP and programmatic implementation to meet stormwater WLAs included in EPA approved TMDLs.

Watershed assessments are completed to systematically identify opportunities for watershed restoration. The completion of watershed assessments for the entire County is labor and cost intensive.

During this permit cycle, Harford County will complete watershed assessments, hereafter called small watershed assessments, as detailed below in order to provide sufficient opportunities to meet the restoration requirements established within this permit.

Watershed Assessment Master Plan

A watershed restoration master plan was completed during this reporting period and is included in Appendix E1. The master plan included a GIS desktop analysis used to assign a priority ranking to each of the County's subwatersheds and a schedule for conducting small watershed assessments. The analysis was based on percent impervious cover, current subwatershed conditions, and proximity to adjacent impacted subwatersheds. The schedule focuses on conducting small watershed assessments with the anticipation that restoration

implementation will begin within three years. Watershed functions are highly dynamic and field changes can occur rapidly. Conducting detailed small watershed assessments for the entire county is not cost effective and can lead to obsolete plans that need to be updated prior to implementation.

The following are the top three watershed priorities to be completed within this permit term:

Proposed Small Watershed Assessments (7,020 acres)

Unnamed Tributary to Gunpowder River – 670 acres

Lower Winters Run – 3,220 acres

Upper Middle Bynum Run – 3,130 acres

The following small watershed assessments have been completed and are available online at <http://www.HarfordCountyMD.gov/HarfordStreams> :

Completed Small Watershed Assessments (4,910 acres)

Wheel Creek (2008) - 740 acres

Plumtree Run (2011) - 1,650 acres

Sam's Branch (2012) - 370 acres

Foster Branch (2012) - 1,420 acres

Declaration Run (2014) – 430 acres

Riverside Area (2014) – 300 acres

1. Watershed Assessments

- a. By the end of the permit term, Harford County shall complete detailed watershed assessments for the entire County. Watershed Assessments conducted during the previous permit cycles may be sued to comply with this requirement provide the assessments include all of the items listed in Part IV.E.a.b. below. Assessments shall be performed at tan appropriate watershed scale (e.g. Maryland hierarchical eight or twelve –digit sub-basins) and be based on MDE’s TMDL analysis or an equivalent and comparable County water quality Analysis.
- b. Watershed assessments by the County shall:
 - i. Determine current water quality conditions;
 - ii. Include the results of a visual watershed inspection;
 - iii. Identify and rank water quality problems;
 - iv. Prioritize all structural and nonstructural water quality improvement projects; and
 - v. Specify pollutant load reduction benchmarks and deadlines that demonstrate progress toward meeting all applicable stormwater WLAs.

Upper Bynum Run Assessment

A small watershed assessment was initiated for Upper Bynum Run during this reporting period. The assessment will only include the watershed from Maryland Route 22 north to the headwaters and only covers approximately one third of the total Bynum Run watershed. The town of Bel Air will be included in the overall assessment area. The assessment will include an evaluation of the current watershed and water quality conditions; identification and prioritization of projects and management actions with the watershed; estimation of impervious acres treated; and documentation of the results. Restoration opportunities will focus heavily on addressing the sediment TMDL for Bynum Run. A scope of services for the Upper Bynum Run Small Watershed Assessment is included in Appendix E1.

Deer Creek Basin Assessment

The County, with the assistance of KCI Technologies, completed a Deer Creek Watershed Restoration Action Strategy (WRAS) in 2007. To help meet current watershed assessment permit conditions, the County requested an update to the 2007 Deer Creek WRAS from KCI. The watershed assessment will focus on the urban stormwater sector and will generally not include analysis or assessment for the non-urban sectors. The assessment will compile exiting information on current water quality conditions and results of a visual inspection of the watershed. From this information, water quality problems will be identified and ranked, structural and non-structural water quality improvement projects will be proposed and prioritized. The assessment will also provide estimated pollutant load reductions and impervious credits to be achieved with the implementation of the assessment's recommended projects and programs to demonstrate progress towards meeting the County's Bay TMDL reduction and impervious surface treatment goals.

The draft report for the Deer Creek Watershed Assessment plan is included in Appendix E1.

2. Restoration Plans

- a. Within one year of permit issuance, Harford County shall submit an impervious surface area assessment consistent with the methods described in the MDE document "Accounting for Stormwater Wasteload Allocations and Impervious Acres Treated, Guidance for National Pollutant Discharge Elimination System Stormwater Permits" (MDE, June 2011 or subsequent versions). Upon approval by MDE, this impervious surface area assessment shall serve as the baseline for the restoration efforts required in this permit.

Impervious Surface Assessment

In February 2017, MDE provided comments to Harford County for the updated impervious assessment submitted on August 1, 2016. MDE approved an impervious baseline of 11,094 acres and requested additional information for approximately 400 impervious acres submitted for consideration to be removed from the baseline. As recommended by MDE, Harford County

will submit a revised impervious surface assessment as part of the County's fourth year permit renewal application. Correspondence is included in Appendix E2.

During this reporting period, Harford County initiated an assessment of grass swales. The assessment will follow guidance developed by Maryland State Highway and approved by MDE <https://www.roads.maryland.gov/OED/SHA-Existing-Water-Quality-Grass-Swale-Identification-Protocol-and-Appendices.pdf>. All grass swales identified that meet requirements will be included in Harford County's inventory of BMPs for triennial inspection and verification. A scope of work for the Identification of Grass Swales is included in Appendix E2.

By the end of this permit term, Harford County shall commence and complete the implementation of restoration efforts for twenty percent of the County's impervious surface area consistent with the methodology described in the MDE document cited in PART IV.E.2.a. that has not already been restored to the MEP. Equivalent acres restored of impervious surfaces, through new retrofits or the retrofit of pre-2002 structural BMPs shall be based upon the treatment of the WQv criteria and associated list of practices defined in the 2000 Maryland Stormwater Design Manual. For alternate BMPs, the basis for calculation of equivalent impervious acres restored is based upon the pollutant loads from forested cover.

Watershed Restoration Projects

During this reporting period, two watershed restoration projects were completed for a total cost for design and construction of \$1,446,232 (Appendix E2). Combined, these projects treat 24.86 impervious acres. Three projects were under construction at the end of this reporting period and 14 projects were under design.

Watershed Restoration Projects (Completed)

Country Walk 1B SWM Retrofit

Foster Branch at Dembytown Stream Restoration

Watershed Restoration Projects (Under Construction)

Lower Wheel Creek SWM Retrofit & Stream Restoration (Phase 2)

Abingdon Library Water Quality Improvements
Leight Center Parking Lot Green Infrastructure

Watershed Restoration Projects (Under Design)

Annie's Playground Stream Restoration
Bynum Run at St Andrews Stream Restoration
Bear Cabin Branch Wetland and Stream Restoration
Church Creek Elementary School SWM Retrofit & Stream Restoration
Foster Branch at Stillmeadow Stream Restoration
Heavenly Pond Wetland & Stream Creation
Magnolia Elementary & Middle School Water Quality Improvements
Northwest Branch Declaration Run Stream Restoration
Plumtree Run at Barrington Stream Restoration
Tributary to Plumtree Run at Wakefield Manor Stream Restoration
Stormwater Retrofit at Homestead Elementary
Sunnyview Drive Stream Restoration
Ring Factory Elementary SWM Retrofit & Stream Restoration
Willoughby Beach Road Extended SWM Retrofit & Stream Restoration

Through this reporting period, watershed restoration has been completed for a total of 138.5 impervious acres, including 5.1 impervious acres from seven tree plantings not recorded from previous fiscal years.

For projects listed above under design, construction is anticipated to be completed for 129 impervious acres in 2018 and 212 impervious acres in 2019. Harford County anticipates issuing designs for 8 new projects for a total of 159 impervious acres and is actively investigating additional new projects.

Approximately, 400 additional credits are projected from annual treatment from septic pump out, connections to WWTP, and installation of Best Available Technology or BAT systems.

A summary of status of the restoration projects is included in Appendix E2.

Watershed Restoration Project Monitoring

Woodbridge Stream Restoration Post – Construction Monitoring

The County has contracted with KCI Technologies, Inc. to conduct post-construction monitoring for the Woodbridge Stream Restoration project that was completed in April 2015. The main purpose of this study is to document and analyze the current and future stability of the restoration project and to support the County in its efforts to comply with the Woodbridge Stream Restoration Joint Permit (permit # 2011-60634-M24). Post-construction monitoring will be conducted annually for three years and will include geomorphic, physical habitat, riparian buffer planting, biological assessments, and structure inspections. The report documenting Year 1 of the monitoring efforts is included in Appendix E2.

Dembytown Stream Restoration Post – Construction Monitoring

The County recently completed the Dembytown stream restoration project along an unnamed tributary to Foster Branch, and the Army Corps of Engineers (ACOE) is requiring specific monitoring to be completed as a condition of the permit. Information and data collected for the required activities will be used to evaluate the success of the restoration project. The Army Corps of Engineers outlined the success criteria and years when monitoring activities should occur. Harford County has received a scope of work and fee from KCI Technologies to complete these monitoring requirements. A copy of the scope of work is included in Appendix E2.

- b. Within one year of permit issuance, Harford County shall submit to MDE for approval a restoration plan for each stormwater WLA approved by EPA prior to the effective date of the permit. The County shall submit restoration plans for subsequent TMDL WLAs within one year of EPA approval. Upon approval by MDE, these restoration plans will be enforceable under this permit. As part of the restoration plans, Harford County shall:
 - i. Include the final date for meeting applicable WLAs and a detailed schedule for implementing all structural and nonstructural water quality improvement projects, enhanced stormwater management programs, and alternative stormwater control initiatives necessary for meeting applicable WLAs;
 - ii. Provide detailed cost estimates for individual projects, programs, controls, and plan implementation;
 - iii. Evaluate and track the implementation of restoration plans through monitoring or modeling to document the progress toward meeting established benchmarks, deadlines, and stormwater WLAs; and
 - iv. Develop an ongoing, iterative process that continuously implements structural and nonstructural restoration projects, program enhancements, new and additional programs, and alternative BMPs where EPA approved TMDL stormwater WLAs are not being met according to the benchmarks and deadlines established as part of the County's watershed assessments.

Watershed Restoration Plans

Completed Restoration Plans

On April 12, 2017, Harford County received comments from MDE in response to the County's submittal of the Harford County Chesapeake Bay TMDL Restoration Plan and Bynum Run

Sediment TMDL Restoration Plan. Comments include removal of credits for existing tree buffers and dry detention stormwater facilities and the separation of restoration from growth. MDE has also requested more detailed information for schedules and benchmarks and site specific, cost estimates, BMP types and load reductions. A copy of the comments is included in Appendix E2.

Harford County will address these comments during the next reporting period.

Bush River PCB TMDL Restoration Plan

During this reporting period, EPA approved the Bush River TMDL for PCBs on August 2, 2016. In accordance this section, Harford County is required to submit a restoration plan within one year of EPA approval. EA Engineering, Science, and Technology, Inc., PBC (EA) has developed a scope of work and cost estimate to develop a restoration plan to address the County's portion of the stormwater waste load allocation for the PCB TMDL for Bush River. A copy of the scope of work is included in Appendix E2.

Swan Creek Sediment TMDL Restoration Plan

During this reporting period, EPA approved the Swan Creek TMDL for Sediment on September 30, 2016. In accordance this section Harford County is required to submit a restoration plan within one year of EPA approval. AECOM has developed a scope of work and cost estimate to develop a restoration plan to address the County's portion of the stormwater waste load allocation for the sediment TMDL for Swan Creek. A copy of the scope of work is included in Appendix E2.

Watershed Restoration Monitoring

USGS Stream Gages

Harford County Department of Public Works and the United States Geological Survey (USGS) partnered for the continued operation of the following gages through June 2016

Bynum Run at Bel Air (01581500) – restarted 1999

Plumtree Run near Bel Air (01581752) – installed 2001

James Run near Belcamp (01581649) – installed 2004

Swan Creek at Swan Creek (01580700) – installed 2007

Wheel Creek near Abingdon (0158175320) – installed 2009

Foster Branch near Joppatowne (01585075) – installed 2015

The operation of these gages supports the ongoing efforts to create a state-wide stream gaging network, and the data will supplement information recorded at additional Harford County gages that are not funded by the County. The data collected at each of these gages is presented in ‘real-time’ at <http://waterdata.usgs.gov/md/nwis/rt>.

During this reporting period, the Harford County MS4 Office continued to partner with the USGS to monitor the water quality in the Plumtree Run Watershed and established a second water quality monitoring station in the Foster Branch Watershed. The County developed long-term restoration plans for these watersheds and is conducting monitoring activities through a single, coordinated strategy rather than by monitoring each individual stream restoration project in each watershed. All water quality monitoring is conducted at the Plumtree Run gage (USGS monitoring station 01581752) and the Foster Branch gage (USGS monitoring station 01585075), and site operation is designed to be compatible with the Chesapeake Bay Nontidal Monitoring Network (NTN) to maintain the ability to compare conditions observed at this station to those measured across the region. The monitoring plan consists of samples collected on a monthly fixed-frequency interval augmented with samples collected during eight to ten storm events that are analyzed for nutrients, suspended sediment, and dissolved chloride and *E. coli* bacteria. Continuous water quality monitoring data for water temperature, specific conductance and turbidity is also collected and displayed in near real time on the USGS web page.

Data collected for this study will be used to detail current water quality conditions in Plumtree Run and Foster Branch and document improvements to water quality as watershed restoration activities are implemented in the watershed. All data is reviewed and posted in the USGS National Water Information System (NWIS) and published in the USGS annual data report of the MD-DE-DC Water Science Center available at <http://wdr.water.usgs.gov/>.

Plumtree Run and Foster Branch Monitoring Plans

The Harford County MS4 Office contracted with KCI Technologies to develop monitoring plans for the Plumtree Run and Foster Branch watersheds. The primary goal of this effort is to

characterize baseline biological, physical habitat, and chemical stream conditions prior to the implementation of additional stream restoration projects. A secondary goal is to have a monitoring plan which also serves to collect data that can be used to document ecological uplift as restoration projects are completed within these watersheds.

Both monitoring plans follow a Before-After, Control-Impact (BACI) study design. By implementing this monitoring plan before more projects are implemented, a baseline condition can be described; the “Before” portion of the BACI. By continuing with this effort far enough in the future to collect data after project implementation, the “After” portion of the BACI concept is captured as well. Plumtree Run and Foster Branch are the watersheds where these treatments will be applied, the “Impact” portion of the BACI concept. A local urban/suburban reference/control site is nearby; the “Control” portion of the BACI design. The County and KCI feel this is the best strategy for measuring ecological response or ecological lift to the implementation of the Plumtree Run and Foster Branch Watershed Small Watershed Action Plans.

Five in-stream monitoring sites are located in each watershed and will be assessed for benthic macroinvertebrates, spring and summer physical habitat, fish, herpetofauna, invasive plants and in situ water chemistry. Sampling methods used will be consistent with the Maryland Biological Stream Survey (MBSS) procedures (DNR, 2015). The MBSS protocols are standard for biomonitoring efforts across Maryland. Using these MBSS protocols will allow a direct comparison to DNR-collected data, allowing use of a 4,100+ stream site dataset for comparison with results from Plumtree Run and Foster Branch. Draft Foster Branch and Plumtree Run Monitoring reports for Year 2 are included in Appendix E2.

3. Public Participation

Harford County shall provide continual outreach to the public regarding the development of its watershed assessments and restoration plans. Additionally, the County shall allow for public participation in the TMDL process, solicit input, and incorporate any relevant ideas and program improvements that can aid in achieving TMDLs and water quality standards. Harford County shall provide:

- a. Notice in a local newspaper and the County's website outlining how the public may obtain information on the development of watershed assessments and stormwater watershed restoration plans and opportunities for comment;
- b. Procedures for providing copies of watershed assessments and stormwater watershed restoration plans to interested parties upon request;
- c. A minimum 30 day comment period before finalizing watershed assessments and stormwater watershed restoration plans; and
- d. A summary in each annual report of how the County addressed or will address any material comment received from the public.

No new watershed restoration plans or watershed assessments were completed during this reporting period. All completed plans and assessments are available on the County's website www.HarfordCountyMD.gov/HarfordStreams. Harford County anticipates engaging the community for input for the Upper Bynum Run Small Watershed Assessment that was initiated during this reporting period.

4. TMDL Compliance

Harford County shall evaluate and document its progress toward meeting all applicable stormwater WLAs included in EPA approved TMDLs. An annual TMDL assessment report with tables shall be submitted to MDE. This assessment shall include complete descriptions of the analytical methodology used to evaluate the effectiveness of the County's restoration plans and how these plans are working toward achieving compliance with EPA approved TMDLs. Harford County shall further provide:

- a. Estimated net change in pollutant load reductions from all completed structural and nonstructural water quality improvement projects, enhanced stormwater management programs, and alternative stormwater control initiatives;
- b. A comparison of the net change in pollutant load reductions detailed above with the established benchmarks, deadlines, and applicable stormwater WLAs;
- c. Itemized costs for completed projects, programs, and initiatives to meet established pollutant reduction benchmarks and deadlines;
- d. Cost estimates for completing all projects, programs, and alternatives necessary for meeting applicable stormwater WLAs; and
- e. A description of a plan for implementing additional watershed restoration actions that can be enforced when benchmarks, deadlines, and applicable stormwater WLAs are not being met or when projected funding is inadequate.

For the projects constructed during this reporting period, load reductions calculated by the design engineers based on the Expert Panels were used. These loads appear significantly greater than loads previously reported projects. Harford County will review the previous loads calculated using the Urban Stormwater Calculator (MD DNR, March 2016).and updated progress for the next report. A summary of the load reductions is included in Appendix E4.

F. Assessment of Controls

Harford County and ten other municipalities in Maryland have been conducting discharge characterization monitoring since the early 1990s. From this expansive monitoring, a statewide database has been developed that includes hundreds of storms across numerous land uses. Analyses of this dataset and other research performed nationally effectively characterize stormwater runoff in Maryland for NPDES municipal stormwater purposes. To build on the existing information and to better track progress toward meeting TMDLs, better data are needed on ESD performance and BMP efficiencies and effectiveness.

Assessment of controls is critical for determining the effectiveness of the NPDES stormwater management program and progress toward improving water quality. The County shall use chemical, biological, and physical monitoring to assess watershed restoration efforts, document BMP effectiveness, or calibrate water quality models for showing progress toward meeting any applicable WLAs developed under EPA approved TMDLs identified above. Additionally, the County shall conduct physical stream monitoring to assess the implementation of the latest version of the 2000 Maryland Stormwater Design Manual. Specific monitoring requirements are described below.

1. Watershed Restoration Assessment

The County shall continue monitoring in the Wheel Creek watershed, or select and submit for MDE's approval a new watershed restoration project for monitoring. Monitoring activities shall occur where the cumulative effects of watershed restoration activities can be assessed. One outfall and an associated in-stream station, or other locations based on a study design approved by MDE, shall be monitored. The minimum criteria for chemical, biological, and physical monitoring are as follows:

Wheel Creek Watershed Background

In 2009, the Harford County MS4 Office and MDE selected the Wheel Creek watershed to monitor ambient conditions. The Wheel Creek watershed (unofficially named) is centrally located in Harford County, approximately three miles south of the Town of Bel Air. It is a second order tributary to Winters Run (MDE8DIGIT 02130702) and Atkisson Reservoir (MDE8DIGIT 02130703) in the Bush River watershed (MDE6DIGIT 021307). Wheel Creek is situated along the eastern edge of the Piedmont physiographic province, drains 435 acres, and contains approximately 27% impervious cover. A mixture of commercial and high density residential land use dominate the headwaters, along with a mixture of medium and low density residential land use. The Harford Glen Environmental Education Center, which is part of the Harford County Public School system, is located in the lower reaches of the watershed and is predominately forest.

Wheel Creek Watershed

435 acres

27% impervious cover

This watershed was selected based on the channel instability, sedimentation, pond retrofit and stream restoration opportunities and implementation recommendations outlined initially in the *Bush River Water Restoration Action Strategy* and more detailed in the *Wheel Creek Small Watershed Assessment*.

Wheel Creek Small Watershed Assessment

The priority restoration projects recommended in the 2008 Wheel Creek Small Watershed Assessment have been constructed. The following is a summary of each project along with the completion date.

Constructed

Gardens of Bel Air SWM Retrofit (2013)

Calverts Walk Stream Restoration (2013)

Festival at Bel Air SWM Retrofit (2015)

Country Walk 1A SWM Retrofit (2015)

Phase 1 - Lower Wheel Creek Stream Restoration and WQ Facilities (2016)

County Walk 1B SWM Retrofit (2017)

Phase 2 - Lower Wheel Creek Stream Restoration (2017)

Project success will be evaluated through a pre- and post-construction monitoring effort that includes chemical, biological and physical monitoring components that began in January 2009.

a. Chemical Monitoring:

- i. Eight (8) storm events shall be monitored per year at each monitoring location with at least two occurring per quarter. Quarters shall be based on the calendar year. If extended dry weather periods occur, baseflow samples shall be taken at least once per month at the monitoring stations if flow is observed;
- ii. Discrete samples of stormwater flow shall be collected at the monitoring stations using automated or manual sampling methods. Measurements of pH and water temperature shall be taken;
- iii. At least three (3) samples determined to be representative of each storm event shall be submitted to a laboratory for analysis according to method listed under 40 CFR Part 136 and event mean concentrations (EMC) shall be calculated for:

Biochemical Oxygen Demand (BOD5)	Total Lead
Total Kjeldahl Nitrogen (TKN)	Total Copper
Nitrate plus Nitrite	Total Zinc
Total Suspended Solids	Total Phosphorus
Total Petroleum Hydrocarbons (TPH)	Hardness
E. coli or enterococcus	
- iv. Continuous flow measurements shall be recorded at the in-stream monitoring station or other practical locations based on the approved study design. Data collected shall be used to estimate annual and seasonal pollutant loads and reductions, and for the calibration of watershed assessment models. Pollutant load estimates shall be reported according to any EPA approved TMDLs with a stormwater WLA.

Wheel Creek Chemical Monitoring Sites

Three permanent water quality monitoring stations were established in the Wheel Creek watershed between the summer of 2010 and the spring of 2011.

Station WC002 (In-stream)

Located on the mainstem of Wheel Creek just downstream of Wheel Road

Station WC003 (Outfall)

Located on the Middle Branch of Wheel Creek
Outfall from the instream SWM facility on Cinnabar Lane

Station WC004 (In-stream)

Located upstream of WC003 on the Middle Branch just off Wheel Court

Chemical Sample Analysis

Each sample collected in Wheel Creek was analyzed for the parameters listed in the table below using Standard Methods or EPA methods. Eurofins/QC Laboratory analyzed the stormflow and baseflow samples for all parameters except for *Escherichia coli* which were analyzed by Enviro-Chem Laboratory.

Parameter	Method	Reporting Limit
5-day Biological Oxygen Demand (BOD5)	SM 5210 B	2.00 mg/L
Total Suspended Solids (TSS)	SM 2540 D	4.00 mg/L
Total Kjeldahl Nitrogen (TKN)	EPA 351.2	0.200 mg/L
Total Phosphorus (TP)	EPA 365.4	0.20 mg/L
Total Petroleum Hydrocarbons (TPH)	EPA 1664BSGT@PHC	0.05 mg/L
Total Copper (Cu)	EPA 200.7 Rev 4.4	0.01 mg/L
Total Zinc (Zn)	EPA 200.7 Rev 4.4	0.001 mg/L
Total Lead (Pb)	EPA 200.7 Rev 4.4	0.015mg/L
Total Hardness	CALC (200.8)	0.050 mg/L
Total Nitrate (NO3) + Nitrite (NO2)	EPA 300.0	0.050 mg/L
<i>E. coli</i>	SM 9223B	5 MPN/100mL

Wheel Creek Chemical Monitoring Results

Wheel Creek Year 7 Monitoring Results

The water quality monitoring results include baseflow and stormflow concentration data, event mean concentration (EMC) values and pollutant loading results collected from July 2016 through June 2017. During this reporting period, the County continued to contract with Versar, Inc. to collect samples during stormflow events. A total of 8 storm events were collected at Station WC002, 6 events at Station WC003 and 9 events at Station WC004. The Country Walk 1B Stormwater retrofit was under construction from January through mid-April 2017 and Station WC003 was offline during that time resulting in only 6 events being captured at that station. During the March 1 storm event, there were equipment failures at Station WC002, so no samples were collected. When a storm event was sampled, three water quality samples were collected and composited at each station over the course of the storm hydrograph. Storm event sampling dates are listed below. Continuous flow was collected at each station during each storm event utilizing SIGMA area velocity probes or an ISCO bubbler flow meter. The instantaneous discharge, level, velocity, water temperature and pH were recorded at the time the samples were collected.

Stormflow Sampling Dates	
August 19, 2016	March 20, 2017
September 20, 2016	April 2, 2017
December 1, 2016	May 7, 2017
December 7, 2016	June 20, 2017
March 1, 2017	

During this reporting period, Harford County MS4 Office collected discrete baseflow samples at each station during 12 baseflow events.

Baseflow Sampling Dates	
July 12, 2016	January 30, 2017
August 24, 2016	February 23, 2017
September 27, 2016	March 23, 2017
October 31, 2016	April 20, 2017
November 17, 2016	May 16, 2017
December 20, 2016	June 27, 2017

The MS4 Office continued to contract with Versar to develop a detailed analysis of the sampling methods, materials, data results and discussion for year seven of this monitoring effort. The monitoring report is included in Appendix F1. A brief summary of the results is outlined below.

During baseflow and stormflow conditions, Federal and State reference values for certain nutrients were exceeded on several occasions, confirming stream chemistry impacts from impervious surfaces and commercial and residential development. Nitrogen, calculated from the sum of nitrate, nitrite, and TKN, was present at concentration levels that were greater than the EPA reference value during both baseflow (100% of detectable results) and stormflow (98.6% of the samples) conditions. Total phosphorus, when detected, was greater than the EPA recommended reference value in 86.6% of stormflow samples and 13.9% of baseflow samples.

Metals, especially zinc, continued to be prevalent in both baseflow and storm runoff samples collected in Wheel Creek. Zinc was detected in all baseflow and stormflow samples; however, the concentrations in only three of the storm samples were above MDE's surface water criteria. All lead concentrations were below the MDE acute criterion for stormflow and the chronic criterion for baseflow. Copper was only detected in stormflow samples with 18.8% of the samples greater than MDE's surface water criteria. Copper was not detected in any baseflow samples.

E. coli bacteria concentrations were detected in all baseflow and stormflow samples at all stations, ranging in concentration from 2 to 2,400 MPN/100ml. *E. coli* concentrations were equal to or above the maximum reportable result (2,420 MPN/100ml) in 50.0% of stormflow grab samples. TPH was not detected in any baseflow or stormflow samples.

Average baseflow concentrations of combined nitrate and nitrite, orthophosphate, hardness, zinc, and *E. coli* were highest at Station WC004 compared to the other two stations downstream, which indicates that the most upstream station continues to be a bacteria and nutrient hotspot. When detected, TSS, total phosphorus, BOD, lead, and copper were highest at Station WC002.

Average stormflow EMCs were highest at Station WC004 for ammonia only. The average EMCs for BOD and orthophosphate were highest at Station WC002. The average EMCs for BOD, TSS, nitrate and nitrite, total phosphorus, TKN, zinc, copper, lead, hardness, ammonia, and *E. coli* were highest at Station WC003. Storm EMC values exceeded average baseflow values for most parameters at all stations as a result of mobilization of pollutants during storms from storage on impervious surfaces and in the sediment layer of the stream channel.

Wheel Creek - Continuous Flow Monitoring

In 2012, DNR installed stream level loggers at stations WC002, WC003, and WC004 and up until June 30, 2016, operated and maintained them as well. Due to budget constraints and changes in DNR's monitoring focus, DNR discontinued these efforts, and Versar assumed the responsibility of the operation and maintenance of those loggers. DNR methodologies have been applied and modified as needed. Flow rates were estimated for each station from five-minute level data and using a power-function rating curve. The rating curves were derived using a combination of physically measured flow rates at the station and hydraulic computations. This flow rate data, along with flow meter data collected during individual storm events and USGS data was used to calculate event mean concentrations (EMC) and pollutant loading calculations.

US Geological Survey

Harford County continued to partner with the U.S. Geological Survey for Water Year 2017 to operate and maintain a precipitation gage and a continuous-record streamflow-gaging station. The flow gage is located on Wheel Creek approximately 250 feet upstream of the confluence with Winters Run at Atkisson Reservoir, and the precipitation gage located in Atkisson Reservoir, 0.7 miles upstream of Atkisson Dam.

The gaging station collects stage data by use of a non-submersible pressure transducer system and is interfaced with a Data Collection Platform (DCP) to transmit the data in near real-time to the USGS Maryland-Delaware-DC Water Science Center public webpage. The following items/products were produced by USGS from the operation of streamflow-gaging station:

- (1) A continuous 5-minute recording interval record of gage heights made available to the public in near real-time,
- (2) A stage-discharge relation developed using conventional discharge measurements and corresponding gage heights,
- (3) A record of datum corrections and rating shifts,
- (4) A record of computed unit-value discharge data with mean daily flows and yearly flow statistics,
- (5) Documentation of data analysis, data-quality checks, final data review, and

(6) Publication of computed daily discharge values in the USGS Annual Water-Data Report. Precipitation gage data is collecting using a tipping bucket rain gage. Data collected at the Wheel Creek gages are available in 'real-time' at <http://waterdata.usgs.gov/md/nwis/rt>.

b. Biological Monitoring:

- i. Benthic macroinvertebrate samples shall be gathered each spring between the outfall and in-stream monitoring locations or other practical locations based on an approved study design; and
- ii. The County shall use the EPA Rapid Bioassessment Protocols (RBP), Maryland Biological Stream Survey (MBSS), or other similar method approved by MDE.

Wheel Creek Biological Monitoring Sites

In 2009, Harford County MS4 Office and Maryland Biological Stream Survey (MBSS) staff selected eight biological monitoring stations in support of the Wheel Creek restoration project and the Chesapeake and Atlantic Coastal Bays Trust Fund. Seven stations are located in Wheel Creek and one is located in an adjacent reference watershed. The monitoring stations were selected based on the location of stream restoration and stormwater retrofit projects proposed throughout the watershed. In 2015, due to staffing and budget constraints and an analyses of the existing data, the number of monitoring stations was decreased to four. With the current monitoring design, the goal is to assess the benefits of individual projects on biological communities and assess the efficacy of individual restoration techniques. This could potentially provide valuable data to guide the selection of restoration techniques in the future.

Each site was sampled during the spring and summer sampling periods. During the spring, temperature loggers were deployed at each location then sites were sampled for water chemistry, physical habitat, and presence of vernal pools, herpetofauna, and benthic macroinvertebrates. These same sites were also sampled in the summer for fish, crayfish, freshwater mussels, reptiles, amphibians, invasive riparian vegetation, and instream habitat. Sampling was conducted following the *Maryland Biological Stream Survey Sampling Manual: Field Protocols* (Stranko, et. al, 2010).

Wheel Creek Biological Monitoring Results

Biological results indicate that the streams within the Wheel Creek Watershed are typical of those in urbanized areas of Maryland's Piedmont. At several sites, benthic macroinvertebrate and fish communities, the best indicators of overall stream health, are degraded by multiple stressors resulting from land disturbance, channel alternation and the hydrologic and thermal stressors associated with upstream impervious surfaces. The presence of some sensitive organisms such as mayflies, stoneflies, fallfish, and northern red salamanders suggests that water quality and habitat at some sites is less degraded than at others. During some sampling years, the benthic and fish Indices of Biotic Integrity at some sites (e.g., ATKI-102-X and ATKI-101-X) indicate better conditions. Indices during some years at some of the Wheel Creek sites were comparable to the control site (LWIN-108-X).

The summary report for biological data collected from 2009 – 2016 is included in Appendix F1.

c. Physical Monitoring:

- i. A geomorphologic stream assessment shall be conducted between the outfall and in-stream monitoring locations or in a reasonable area based on the approved study design. This assessment shall include an annual comparison of permanently monumented stream channel cross-sections and the stream profile;

Wheel Creek Geomorphologic Monitoring Sites

In 2010, four assessment reaches were established to assess the geomorphic stability of the stream channels in the Wheel Creek watershed as they respond to restoration activities. Assessment techniques include a survey of permanently-monumented channel cross-sections, a longitudinal profile survey, particle size analysis, substrate facies mapping (Pre-Restoration, Year 1 only), and an assessment of bank pins and scour chains (Pre-Restoration, Years 1 through 4). The monitoring locations were based on the following criteria:

Station WC01

Within a proposed stream stabilization reach

Station WC02

Downstream of a stream stabilization reach and BMP retrofit location

Station WC03

Downstream of a BMP retrofit location only

Station WC04

Control site with no proposed restoration activities

The geomorphic monitoring was not conducted during the previous reporting period because there was active construction occurring on Lower Wheel Creek at Station WC01. Once the construction was completed in March 2017, the geomorphic monitoring resumed. Versar re-established Stations WC01 and WC02 because the benchmark monuments were damaged at both stations during construction. A longitudinal profile of each reach was re-surveyed using a laser level, calibrated stadia rod, and 300-foot measuring tape following the procedure outlined in Harrelson et al. (1994). The profiles were established along the centerline of each bankfull channel and included a survey of breakpoints in and between bed features and delineation of riffle, run, pool, and glide features. A survey of the bankfull elevation where discernible, the top of bank, and the water surface was also performed.

Cross-sectional and longitudinal profile surveys were conducted to establish baseline conditions of channel geometry and slope, to which subsequent data can be compared in determining whether lateral or vertical migration of the channel is occurring.

Modified Wolman pebble counts were completed to assess substrate particle size distribution and track changes in channel roughness. A total of 3 pebble counts were conducted within each monitoring reach, feature-specific pebble counts were conducted at each cross section location within the cross-sectional bed feature, and a weighted pebble count was conducted throughout the entire reach based on the proportion of bed features (e.g., riffle, run, pool, and glide) present within the survey reach.

2017 marks the first year of post-restoration monitoring. Subsequent surveys hopefully will enable comparisons to quantitatively evaluate changes in geomorphological conditions as a result of restoration efforts throughout the watershed. By comparing post-restoration

conditions to the pre-restoration data, any benefits to the stream ecosystem resulting from restoration projects can potentially be quantified. With the current monitoring design, there may have the ability to assess the benefits of individual projects and assess the efficacy of individual restoration techniques. This could provide valuable data to help guide the selection of restoration techniques in the future.

Wheel Creek Geomorphologic Monitoring results are included in Appendix F1.

- ii. A stream habitat assessment shall be conducted using techniques defined by the EPA's RBP, MBSS, or other similar method approved by MDE; and

Wheel Creek Habitat Monitoring Sites

The physical habitat assessment was conducted at each biological monitoring site in Wheel Creek and the Reference Watershed during the 2016 summer index sampling period utilizing MBSS protocols and Stream Habitat Assessment Data Sheets. Metric selection and data analysis followed the guidance document *A Physical Habitat Index for Freshwater Wadeable Streams in Maryland, Final Report, (Paul, et al. 2002)*. Eight metrics were used to calculate the Physical Habitat Index (PHI) for the Piedmont ecoregion. These metrics include percent embeddedness, remoteness, percent shading, epifaunal substrate, instream habitat, instream woody debris and root wads, bank stability and riffle run quality.

Wheel Creek Habitat Monitoring Results

Most physical habitat parameters at the sampling sites in Wheel Creek and Reference Watershed were in the Poor, Marginal or Suboptimal categories. Instream Habitat, a measure of fish habitat quality, was rarely rated Good among all years sampled. Instream Habitat was generally rated higher at the Reference site. Epifaunal Substrate, a measure of benthic macroinvertebrate habitat suitability, was most often rated Poor, Marginal or Sub-optimal, suggesting that habitat for these organisms was generally lacking.

Appendix F1 contains a summary report describing the 2009 -2016 physical habitat monitoring results which is incorporated in the MBSS Biological Monitoring report.

- iii. A hydrologic and/or hydraulic model shall be used (e.g., TR-20, HEC-2, HEC-RAS, HSPF, SWMM, etc.) in the fourth year of the permit to analyze the effects of rainfall; discharge rates; stage; and, if necessary, continuous flow on channel geometry.

- d. Annual Data Submittal: The County shall describe in detail its monitoring activities for the previous year and include the following:
 - i. EMCs submitted on MDE's long-term monitoring database as specified in PART V below;
 - ii. Chemical, biological, and physical monitoring results and a combined analysis for the approved monitoring locations; and
 - iii. Any requests and accompanying justifications for proposed modifications to the monitoring program.

The County continued to contract with Versar to complete an analysis of the water quality, precipitation and stream discharge data collected in Wheel Creek during this reporting period. The report for Year 7 of this project is included in Appendix F1. The report outlines the study design, baseflow, stormflow, synoptic and sediment transport monitoring methods, rainfall and flow rate logging methods, calculations used to determine EMC and pollutant loading rates, followed by a discussion of the data results.

MBSS conducted a biological and physical habitat assessment in the Wheel Creek watershed during the spring and summer seasons. Benthic macroinvertebrates and water quality were collected in the spring, and fish, herptofauna and an evaluation of the physical habitat covered in the summer. Those index periods were selected to sample benthic communities at the time of year when community structure provide useful information about environmental stresses and to sample fish communities during low flow conditions and when spawning migrations are not in progress. Appendix F1 contains a summary report describing the 2009 -2016 biological and physical habitat monitoring results.

2. Stormwater Management Assessment

The County shall continue monitoring the Church Creek watershed, or select and submit for MDE's approval a new watershed restoration project for determining the effectiveness of stormwater management practices for stream channel protection. Physical stream monitoring protocols shall include:

- a. An annual stream profile and survey of permanently monumented cross sections in Church Creek to evaluate channel stability;
- b. A comparison of the annual stream profile and survey of the permanently monumented cross-sections with baseline conditions for assessing areas of aggradation and degradation; and
- c. A hydrologic and/or hydraulic model shall be used (e.g., TR-20, HEC-2, HEC-RAS, HSPF, SWMM, etc.) in the fourth year of the permit to analyze the effects of rainfall; discharge rates; stage; and, if necessary, continuous flow on channel geometry.

Church Creek Monitoring Site

In 2003, the Harford County MS4 Office and MDE selected the Church Creek watershed to provide monitoring for MDE's use to determine the effectiveness of their stormwater management program. Harford County does not utilize this monitoring for its MS4 program.

The 181 acre watershed includes commercial and residential development. The Wexford residential development, which comprises approximately 20% of the watershed, was developed using the 2000 Stormwater Design Manual standards. Approximately 40% of the watershed was developed prior to the implementation of the Design Manual. The Wexford development is served by two extended detention facilities with micropools, one rain garden and two grassed swales. The stream reach, beginning just south of MD Route 7 and extending 2400 linear feet, is surveyed annually. Four permanently monumented cross sections are surveyed, along with the stream profile, bankfull indicators, and water surface elevation. The stream is surveyed in the Fall of each year, following leaf-off.

Church Creek Monitoring Results

The physical assessment was conducted in November and December 2016. The 2016 data show a slight trend in thalweg incision and pool deepening, particularly in the lower reach. Lateral and mid-channel bars of sand and gravel are forming in the lower reaches, increasing bank shear stress as evidenced by several downed trees along the channel. In general, the channel continues to be degraded with some lateral and vertical movement.

Appendix F2 contains the annual report for the 2016 physical monitoring.

G. Program Funding

1. Annually, a fiscal analysis of the capital, operation, and maintenance expenditures necessary to comply with all conditions of this permit shall be submitted as required in PART V below.

During this reporting period, the MS4 Office issued purchase orders totaling \$4.6 M. The following is a summary of expenditures for this reporting period:

FY2017 Expenditures - \$4.5 M

Capital - \$4,229,000

Maintenance - \$347,000

The maintenance and capital expenditures represent purchase orders issued during the reporting period (Appendix G). An additional \$1.3 M was spent in operation expenses.

2. Adequate program funding to comply with all conditions of this permit shall be maintained. Lack of funding does not constitute a justification for noncompliance with the terms of this permit.

In May 2017, the County Council approved the fiscal year 2018 budget. The full budget document is available at the following link

<http://www.harfordcountymd.gov/ArchiveCenter/ViewFile/Item/1313>

FY2018 Projected Revenue - \$693 M

Property Taxes - \$313 M

Income Taxes - \$219 M

Other Revenue \$161 M

The County Council approved the following capital budget for the implementation of this permit:

FY2018 Watershed Protection and Restoration Approved Capital Budget - \$10.7 M

Paygo - \$0.45 M

Future Bonds - \$5.8 M

Proposed Grants - \$4.2 M

Other - \$0.25

Twelve full time positions are funded within the Watershed Protection and Restoration Office for the implementation of this program including the following:

Staff Funded under the Watershed Protection and Restoration Program - \$1.3 M

MS4 Office - 4

Stormwater Plans Review and Inspections Office – 7

Erosion and Sediment Control Plans Review Office – 1

As discussed above under Permit Administration, staff from various other departments and division within the County assists the MS4 Office with the implementation of this permit (Appendix A).

PART V. PROGRAM REVIEW AND ANNUAL PROGRESS REPORTING

A. Annual Reporting

1. Annual progress reports, required under 40 CFR 122.42(c), will facilitate the long-term assessment of Harford County's NPDES stormwater program. The County shall submit annual reports on or before the anniversary date of this permit and post these reports on the County's website. All information, data, and analyses shall be based on the fiscal year and include:
 - a. The status of implementing the components of the stormwater management program that are established as permit conditions including:
 - i. Source Identification;
 - ii. Stormwater Management;
 - iii. Erosion and Sediment Control;
 - iv. Illicit Discharge Detection and Elimination;
 - v. Litter and Floatables;
 - vi. Property Management and Maintenance;
 - vii. Public Education;
 - viii. Watershed Assessment;
 - ix. Restoration Plans;
 - x. TMDL Compliance;
 - xi. Assessment of Controls; and
 - xii. Program Funding.
 - b. A narrative summary describing the results and analyses of data, including monitoring data that is accumulated throughout the reporting year;

- c. Expenditures for the reporting period and the proposed budget for the upcoming year;
 - d. A summary describing the number and nature of enforcement actions, inspections, and public education programs;
 - e. The identification of water quality improvements and documentation of attainment and/or progress toward attainment of benchmarks and applicable WLAs developed under EPA approved TMDLs; and
 - f. The identification of any proposed changes to the County's program when WLAs are not being met.
2. To enable MDE to evaluate the effectiveness of permit requirements, the following information shall be submitted in a format consistent with Attachment A:
- a. Storm drain system mapping (PART IV.C.1);
 - b. Urban BMP locations (PART IV.C.3);
 - c. Impervious surfaces (PART IV.C.4);
 - d. Water quality improvement project locations (PART IV.C.6);
 - e. Monitoring site locations (PART IV.C.5);
 - f. Chemical monitoring results (PART IV.F.1);
 - g. Pollutant load reductions (PART IV.E.4 and IV.F.1);
 - h. Biological and habitat monitoring (PART IV. F.1);
 - i. Illicit discharge detection and elimination activities (PART IV.D.3);
 - j. Erosion and sediment control and stormwater program information (PART IV.D.1 and IV.D.2);
 - k. Grading permit information - quarterly (PART IV. D.2); and

I. Fiscal analyses - cost for NPDES related implementation (PART IV. G).

3. Because this permit uses an iterative approach to implementation, the County must evaluate the effectiveness of its programs in each annual report. BMP and program modifications shall be made within 12 months if the County's annual report does not demonstrate compliance with this permit and show progress toward meeting WLAs developed under EPA approved TMDLs.

B. Program Review

In order to assess the effectiveness of the County's NPDES program for eliminating non-stormwater discharges through the illicit connection program and reducing the discharge of pollutants to protect water quality, MDE will review program implementation, annual reports, and periodic data submittal. Procedures for the review of local erosion and sediment control and stormwater management programs exist in Maryland's sediment control and stormwater management laws. Additional evaluations may be conducted at MDE's discretion to determine compliance with permit conditions.

C. Reapplication for NPDES Stormwater Discharge Permit

This permit is effective for no more than five years, unless administratively continued by MDE. Continuation or reissuance of this permit beyond this permit term will require the County to reapply for NPDES stormwater discharge permit coverage in its fourth year annual report. Failure to reapply for coverage constitutes a violation of this permit.

As part of this application process, Harford County shall submit to MDE an executive summary of its NPDES stormwater management program that specifically describes how the County is meeting the overall goal to ensure that each County watershed has been thoroughly evaluated and its progress in implementing water quality improvements. This application shall be used to gauge the effectiveness of the County's NPDES stormwater program and will provide guidance for developing future permit conditions. At a minimum, the application summary shall include:

1. Harford County's NPDES stormwater program goals;
2. Program summaries for the permit term regarding:
 - a. Illicit discharge detection and elimination results;
 - b. Restoration plan status including County totals for impervious acres, impervious acres controlled by stormwater management, the current status of water quality improvement projects and acres managed, and documentation of progress toward meeting stormwater WLAs developed under EPA approved TMDLs;
 - c. Pollutant load reductions as a result of this permit and an evaluation of whether TMDLs are being achieved;
 - d. Impervious acres compared to the baseline and twenty percent restoration requirement in PART IV.E.2.a.; and
 - e. Other relevant data and information for describing County programs;
3. Program operation and capital improvement costs for the permit term; and
4. Descriptions of any proposed permit condition changes based on analyses of the successes and failures of the County's efforts to comply with the conditions of this permit.

PART VI. SPECIAL PROGRAMMATIC CONDITIONS

A. Chesapeake Bay Restoration by 2025

A Chesapeake Bay TMDL has been developed by the EPA for the six Bay States (Delaware, Maryland, New York, Pennsylvania, Virginia, and West Virginia) and the District of Columbia. The TMDL describes the level of effort that will be necessary for meeting water quality criteria and restoring Chesapeake Bay. This permit is requiring compliance with the Chesapeake Bay TMDL through the use of a strategy that calls for the restoration of twenty percent of previously developed impervious land with little or no controls within this five year permit term as described in Maryland's Watershed Implementation Plan. The TMDL is an aggregate of nonpoint sources or the load allocation (LA), and point sources or WLA, and a margin of safety. The State is required to issue NPDES permits to point source discharges that are consistent with the assumptions of any applicable TMDL, including those approved subsequent to permit issuance.

Urban stormwater is defined in the CWA as a point source discharge and will subsequently be a part of Maryland's WLA. The NPDES stormwater permits can play a significant role in regulating pollutants from Maryland's urban sector and in the development of Chesapeake Bay Watershed Implementation Plans. Therefore, Maryland's NPDES stormwater permits issued to Harford County and other municipalities will require coordination with MDE's Watershed Implementation Plan and be used as the regulatory backbone for controlling urban pollutants toward meeting the Chesapeake Bay TMDL by 2025.

B. Comprehensive Planning

Harford County shall cooperate with other agencies during the completion of the Water Resources Element (WRE) as required by the Maryland Economic Growth, Resource Protection and Planning Act of 1992 (Article 66B, Annotated Code of Maryland). Such cooperation shall entail all reasonable actions authorized by law and shall not be restricted by the responsibilities attributed to other entities by separate State statute, including but not limited to reviewing and approving plans and appropriating funds.

PART VII. ENFORCEMENT AND PENALTIES

A. Discharge Prohibitions and Receiving Water Limitations

Harford County shall prohibit non-stormwater discharges through its MS4. NPDES permitted non-stormwater discharges are exempt from this prohibition. Discharges from the following will not be considered a source of pollutants when properly managed: water line flushing; landscape irrigation; diverted stream flows; rising ground waters; uncontaminated ground water infiltration to separate storm sewers; uncontaminated pumped ground water; discharges from potable water sources; foundation drains; air conditioning condensation; irrigation waters; springs; footing drains; lawn watering; individual residential car washing; flows from riparian habitats and wetlands; de-chlorinated swimming pool discharges (not including filter backwash); street wash water; and firefighting activities.

Consistent with §402(p)(3)(B)(iii) of the CWA, the County shall take all reasonable steps to minimize or prevent the contamination or other alteration of the physical, chemical, or biological properties of any waters of the State, including a change in temperature, taste, color, turbidity, or odor of the waters or the discharge or deposit of any organic matter, harmful organism, or liquid, gaseous, solid, radioactive, or other substance into any waters of the State, that will render the waters harmful to:

1. Public health, safety, or welfare;
2. Domestic, commercial, industrial, agricultural, recreational, or other legitimate beneficial use;
3. Livestock, wild animals, or birds; and
4. Fish or other aquatic life.

B. Duty to Mitigate

Harford County shall take all reasonable steps to minimize or prevent any discharge in violation of this permit that has a reasonable likelihood of adversely affecting human health or the environment.

C. Duty to Comply

Harford County shall be responsible for complying with all conditions of this permit. Other entities may be used to meet various permit obligations provided that both the County and the other entity agree contractually. Regardless of any arrangement entered into however, the County remains responsible for permit compliance. In no case may this responsibility or permit compliance liability be transferred to another entity.

Failure to comply with a permit provision constitutes a violation of the CWA and is grounds for enforcement action; permit termination, revocation, or modification; or denial of a permit renewal application. The County shall comply at all times with the provisions of the Environment Article, Title 4, Subtitles 1, 2, and 4; Title 7, Subtitle 2; and Title 9, Subtitle 3 of the Annotated Code of Maryland.

The County shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) that are installed or used by the County to achieve compliance with the conditions of this permit. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems that are installed by the County only when the operation is necessary to achieve compliance with the conditions of the permit.

D. Sanctions

1. Penalties Under the CWA - Civil and Criminal

Section 309(d) of the CWA, 33 USC §1319(d) provides that any person who violates any permit condition is subject to a civil penalty not to exceed \$25,000 per day for each violation. Pursuant to the Civil Monetary Penalty Inflation Adjustment Rule, 40 CFR Part 19, any person who violates any NPDES permit condition or limitation after December 6, 2013, is liable for an administrative penalty not to exceed \$37,500 per day for each such violation. Section 309(g)(2) of the CWA, 33 USC §1319(g)(2) provides that any person who violates any permit condition is subject to an administrative penalty not to exceed \$10,000 per day for each violation, not to exceed \$125,000.

Pursuant to the Civil Monetary Penalty Inflation Adjustment Rule, 40 CFR Part 19, any person who violates any NPDES permit condition or limitation after December 6, 2013, is liable for an administrative penalty not to exceed \$16,000 per day for each such violation, up to a total penalty of \$187,500. Pursuant to Section 309(c) of the CWA, 33 USC §1319(c), any person who negligently violates any permit condition is subject to criminal penalties of \$2,500 to \$25,000 per day of violation, or imprisonment of not more than one year, or both. If a person has been convicted of negligent violations of the CWA previously, the criminal penalties may be increased to \$50,000 per day of violation, or imprisonment of not more than two years, or both. Any person who knowingly violates any permit condition is subject to criminal penalties of \$5,000 to \$50,000 per day of violation, or imprisonment for not more than three years, or both. If a person has been convicted of knowing violations of the CWA previously, the criminal penalties may be increased to \$100,000 per day of violation, or imprisonment of not more than six years, or both.

2. Penalties Under the State's Environment Article - Civil and Criminal

Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the County from civil or criminal responsibilities and/or penalties for a violation of Title 4, Title 7, and Title 9 of the Environment Article, Annotated Code of Maryland, or any federal, local, or other State law or regulation. Section 9-342 of the Environment Article provides that a person who violates any condition of this permit is liable to a civil penalty of up to \$10,000 per violation, to be collected in a civil action brought by MDE, and with each day a violation continues being a separate violation. Section 9-342 further authorizes the MDE to impose upon any person who violates a permit condition, administrative civil penalties of up to \$10,000 per violation, up to \$100,000.

Section 9-343 of the Environment Article provides that any person who violates a permit condition is subject to a criminal penalty not exceeding \$25,000 or imprisonment not exceeding one year, or both for a first offense. For a second offense, Section 9-343 provides for a fine not exceeding \$50,000 and up to two years imprisonment.

The Environment Article, §9-343, Annotated Code of Maryland, provides that any person who tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished

by a fine of not more than \$50,000 per violation, or by imprisonment for not more than two years per violation, or both.

The Environment Article, §9-343, Annotated Code of Maryland, provides that any person who knowingly makes any false statement, representation, or certification in any records or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or noncompliance shall, upon conviction, be punished by a fine of not more than \$50,000 per violation, or by imprisonment for not more than two years per violation, or both.

E. Permit Revocation and Modification

1. Permit Actions

This permit may be modified, revoked and reissued, or terminated for cause. The filing of a request by the County for a permit modification or a notification of planned changes or anticipated noncompliance does not stay any permit condition. A permit may be modified by MDE upon written request by the County and after notice and opportunity for a public hearing in accordance with and for the reasons set forth in COMAR 26.08.04.10.

After notice and opportunity for a hearing and in accordance with COMAR 26.08.04.10, MDE may modify, suspend, or revoke and reissue this permit in whole or in part during its term for causes including, but not limited to the following:

- a. Violation of any terms or conditions of this permit;
- b. Obtaining this permit by misrepresentation or failure to disclose fully all relevant facts;
- c. A change in any condition that requires either a temporary reduction or elimination of the authorized discharge;
- d. A determination that the permitted discharge poses a threat to human health or welfare or to the environment and can only be regulated to acceptable levels by permit modification or termination;

- e. To incorporate additional controls that are necessary to ensure that the permit effluent limit requirements are consistent with any applicable TMDL WLA allocated to the discharge of pollutants from the MS4; or
- f. As specified in 40 CFR §§122.62, 122.63, 122.64, and 124.5.

2. Duty to Provide Information

The County shall furnish to MDE, within a reasonable time, any information that MDE may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit; or to determine compliance with this permit. The County shall also furnish to MDE, upon request, copies of records required to be kept by this permit.

F. Inspection and Entry

Harford County shall allow an authorized representative of the State or EPA, upon the presentation of credentials and other documents as may be required by law, to:

- 1. Enter the permittee's premises where a regulatory activity is located or conducted or where records must be kept under the conditions of this permit;
- 2. Have access to and obtain copies at reasonable times of any records that must be kept under the conditions of this permit.
- 3. Inspect at reasonable times, without prior notice, any construction site, facility, equipment (including monitoring and control equipment), practices or operations regulated or required under this permit: and
- 4. Sample or monitor at reasonable times, for the purposes of assuring permit compliance or as otherwise authorized by the CWA, any substances or parameters at any location.

G. Monitoring and Record Keeping

Unless otherwise specified by this permit, all monitoring and records of monitoring shall be in accordance of 40 CFR Part 122.41(j).

H. Property Rights

The issuance of this permit does not convey any property rights in either real or personal property, or any exclusive privileges nor does it authorize any injury to private property or an invasion of personal rights, nor any infringement of federal, State, or local law or regulations.

I. Severability

The provisions of this permit are severable. If any provision of this permit shall be held invalid for any reason, the remaining provisions shall remain in full force and effect. If the application of any provisions of this permit to any circumstance is held invalid, the application to other circumstances shall not be affected.

J. Signature of Authorized Administrator and Jurisdiction

Each application, report or other information required under this permit to be submitted to MDE shall be assigned as required by COMAR 26.08.04.01-1. Signatories shall be principal executive officer, ranking elected official, or other duly authorized employee.